CULTURAL LANDSCAPE PLAN
TRAINING FIELD / WINTHROP SQUARE
CHARLESTOWN, MASSACHUSETTS

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Friends of the Training Field

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C O N T E N T S

Cover photograph: ca. 1900 view of the Training Field.

INTRODUCTION

The Training Field, also known as Winthrop Square, is one of Charlestown's oldest and best-loved open spaces. It is an .89-acre park owned by the City of Boston and administered by the Boston Parks and Recreation Department as one of Boston's historic parks. Over the years the Training Field has undergone many changes. It was a training ground for the colonial militia in the 1640s. In 1775 it was witness to the Battle of Bunker Hill. In the nineteenth century the Training Field served multiple functions before becoming the urban park that we know today. Most recently it has seen increased use as a focal point of the Charlestown neighborhood and an important stop along Boston's Freedom Trail.

Despite the significance of the Training Field as a park and historic site, it has been many years since the space has been updated. In the intervening period, the gradual decline of the park has become a matter of increasing concern to Charlestown residents. Major issues identified by community members include: drainage, erosion, poor condition of the turf and trees, as well as worn out park structures and furnishings.

The Boston Parks and Recreation Department, as the city steward of the park, is responsible for its ongoing care and maintenance. In recent years city efforts have been supported by two community groups with a strong interest in the Training Field: the Charlestown Preservation Society and the Friends of the Training Field, which have collaborated on important projects to preserve and enhance Winthrop Square. These have included: a thorough conservation and cleaning of the Soldiers and Sailors monument, as well as research, design and construction of three interpretive panels that convey the rich history of the Training Field.

Most recently these two organizations have raised funds for preparation of this Cultural Landscape Plan, which recognizes the multiple functions that the Training Field must serve -- as a neighborhood park, significant historic site and part of the city-wide open space system. The plan provides an overall framework to guide the Boston Parks and Recreation Department in making improvements that will ensure that the Training Field is welcoming to neighbors and visitors alike.

There are two main parts to the plan, which are followed by appendices with supporting material:

- Chapter 1: History and Significance traces the physical evolution of the Training Field over nearly 400 years and summarizes its historical and archaeological significance.

- Chapter 2: Site Analysis and Treatment Recommendations documents the current physical condition of the park, identifies major issues and problems, and presents recommendations for preservation and rehabilitation, which will guide capital improvements to the park.

The recommendations were developed by the consultant team, working in collaboration with the Boston Parks and Recreation Department and the project partners. Initial findings of the study were discussed at a community meeting in late June 2013, with draft recommendations presented at a second community meeting in September 2013.

1. HISTORY AND SIGNIFICANCE

The first part of this chapter describes the evolution of the Training Field from the first European occupation of Charlestown in 1629 to the present, a period of nearly 400 years. The site history is divided into six periods, each of which is documented by a historical narrative, as well as by historic maps and, for the later periods, photographs and period plans. The second part of the chapter summarizes the historical significance of the Training Field, evaluates its integrity and identifies features that contribute to its historic character.

A. COLONIAL TRAINING FIELD & REVOLUTIONARY WAR SITE (1629-1775)

Charlestown was called Mishawum by the Native Americans who initially occupied the vicinity. The Charlestown area was settled in 1629. Led by Governor John Winthrop, Thomas Graves and a group of English colonists located their village across the river from what would become Boston's North End. (Winthrop moved some settlers across the river in 1630 due to lack of water.) The Charlestown community grew slowly during its first 100 years, remaining small and fairly isolated through the middle of the 18th century. City Square, located at the harbor, was the main public space and the center of the village. The Training Field was located on the edge of the community a short distance up Breed's Hill (later known as Bunker Hill).

Training fields, which were sometimes combined with town commons, were an integral part of most early New England communities. The Charlestown Training Field, one of the "common lands" of the settlement, was first mentioned in the 1640s, making it one of New England's earliest training fields. On annual "Muster Days," the local militia met here for roll call, inspection and parades. The entire town gathered to socialize and watch the citizen soldiers fulfill their civic obligation. (Interpretive Panel: W2 Landscape, BLC Inventory Form)

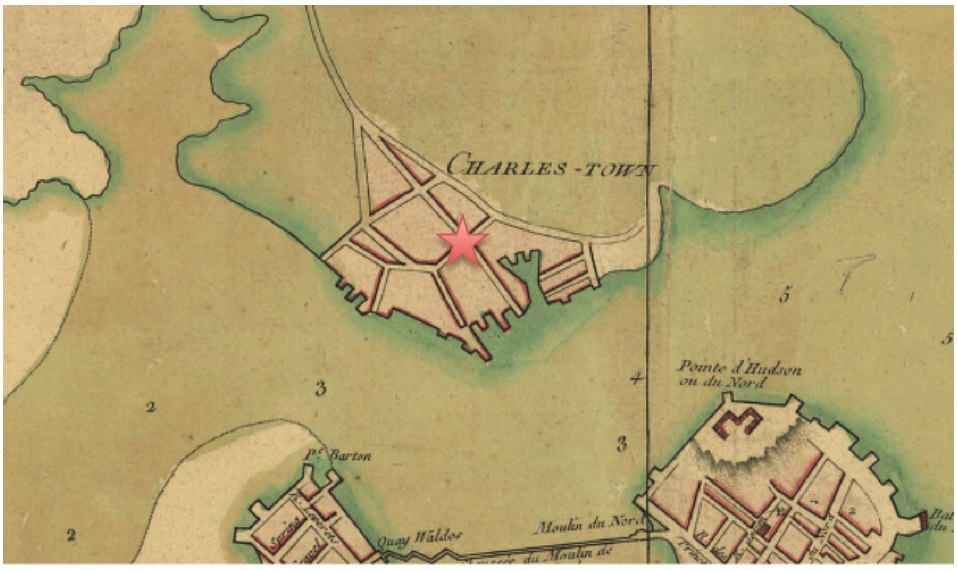

Figure 1.1 - Detail of "Plan de la ville et du port de Boston: capital de la Nouvelle Angleterre, Paris, Ches Lattre" [1764?]. Red star indicates approximate location of Training Field.

The map above shows the small village of Charlestown in the mid-18th century. At the time of the Revolution, the Training Field was still on the outskirts of town and was bordered by mowing lots and pastures. (Boston Landmarks Commission Inventory form)

The Training Field played a part in the American Revolution when Colonial troops marched to Charlestown to prevent the advance of the British soldiers and hastily built earthworks on Breed's Hill, just up slope from the Training Field. On June 17, 1775, in what became known as the Battle of Bunker Hill, British troops attacked the Breed's Hill fortifications uphill from the Training Field, with some troops likely approaching through the Training Field. After the Revolution, the Training Field continued to serve as a mustering ground for the local militia. (Interpretive Panel: W1 Military)

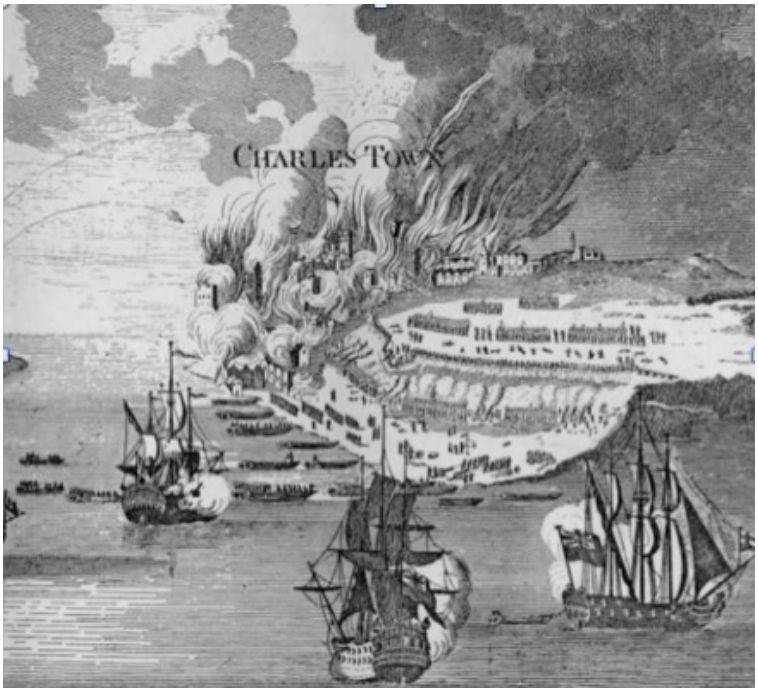

Figure 1.2 - "View of the Attack on Bunker's Hill, with the Burning of Charlestown, June 17, 1775."

Figure 1.3 - "Plan of the heights of Charles Town, & c. R: W: Lieut.: R.W.F. Boston, Dec 13, 1775." Training Field is located between the heights and the ferry inlet. Red star indicates approximate location of the Training Field.

B. MULTI-PURPOSE CIVIC SPACE (1775-1848)

Charlestown's reconstruction after the Revolutionary War created new streets and squares, and extended older streets, including Training Field Street, which ran from the town center northeast to the Training Field. In the late 18th century, the Training Field was still on the fringes of Charlestown. (BLC Inventory form) By the 1840s the area around the Training Field emerged as a well-defined civic space with its boundaries delineated by the adjacent streets. (Interpretive Panel: W2 Landscape, BLC Inventory Form)

Figure 1.4 - Detail of 1818 Peter Tufts map with Training Field in the upper right. Engine house (ca. 1818) is in lower left corner of Training Field. Dots around the Training Field probably depict a wood rail fence. Red circle indicates Training Field.

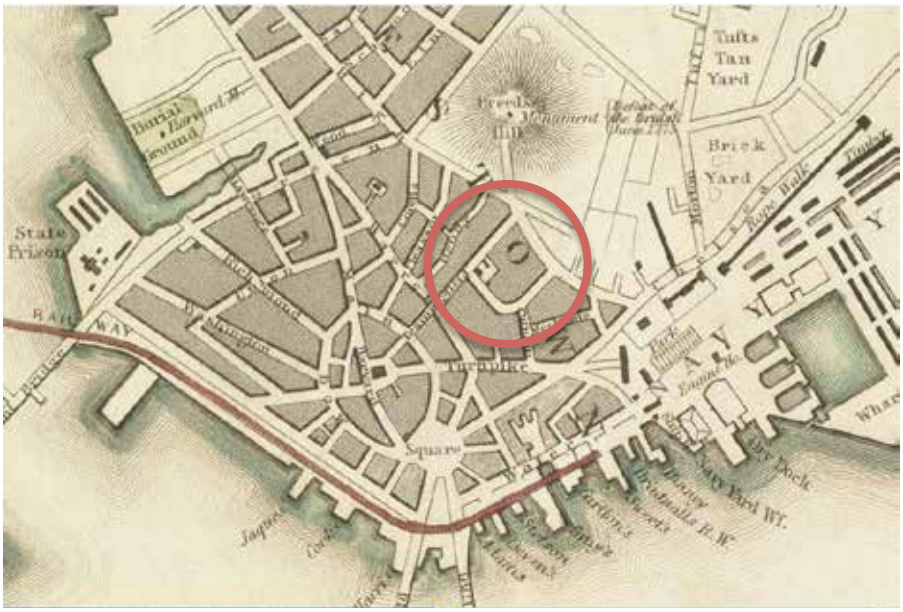

Figure 1.5 - 1842 map of Charlestown showing three buildings on the Training Field. The Bunker Hill monument (upper center of map) was started in 1827 and dedicated in 1843. Red circle indicates Training Field.

Figure 1.6 - The Warren Engine Company #4 engine house (on corner, ca. 1818), Training Field School (large building, 1827) and gun house (far right, ca. 1832) were located in the southwestern corner of the Training Field. All three buildings were removed ca. 1847. This conjectural sketch shows the size and orientation of the buildings as well as the 19th century vertical wooden fencing in front of the school.

Figure 1.7 - This period plan (ca. 1830s), based on historic maps and images, is conjectural because of the scarce information available for this early period. Key features include the three buildings, the perimeter fence and the fence around the buildings. During this period the Training Field would most likely have had rough grass that was used for multiple purposes, like a 19th century town common. Note: "period plan" is a graphic format used to document the appearance of a landscape during a specific period or date. Using a standard graphic technique makes it easier to compare change over time.

C. EARLY CITY PARK (1848-1872)

By the mid 19th century Charlestown had grown from a small village into a substantial community with City Square as its civic and commercial center. The growing economic importance of the community was recognized in 1848 when it became a city with improvements, such as City Hall and redesigned public spaces, to reflect its new stature. In 1848 the Training Field was renamed Winthrop Square to honor John Winthrop, Puritan clergyman, first Colonial governor of Massachusetts and first Charlestown settler. This period marks an important transition of the Training Field from a utilitarian, semi-rural open field to the urban park that exists today.

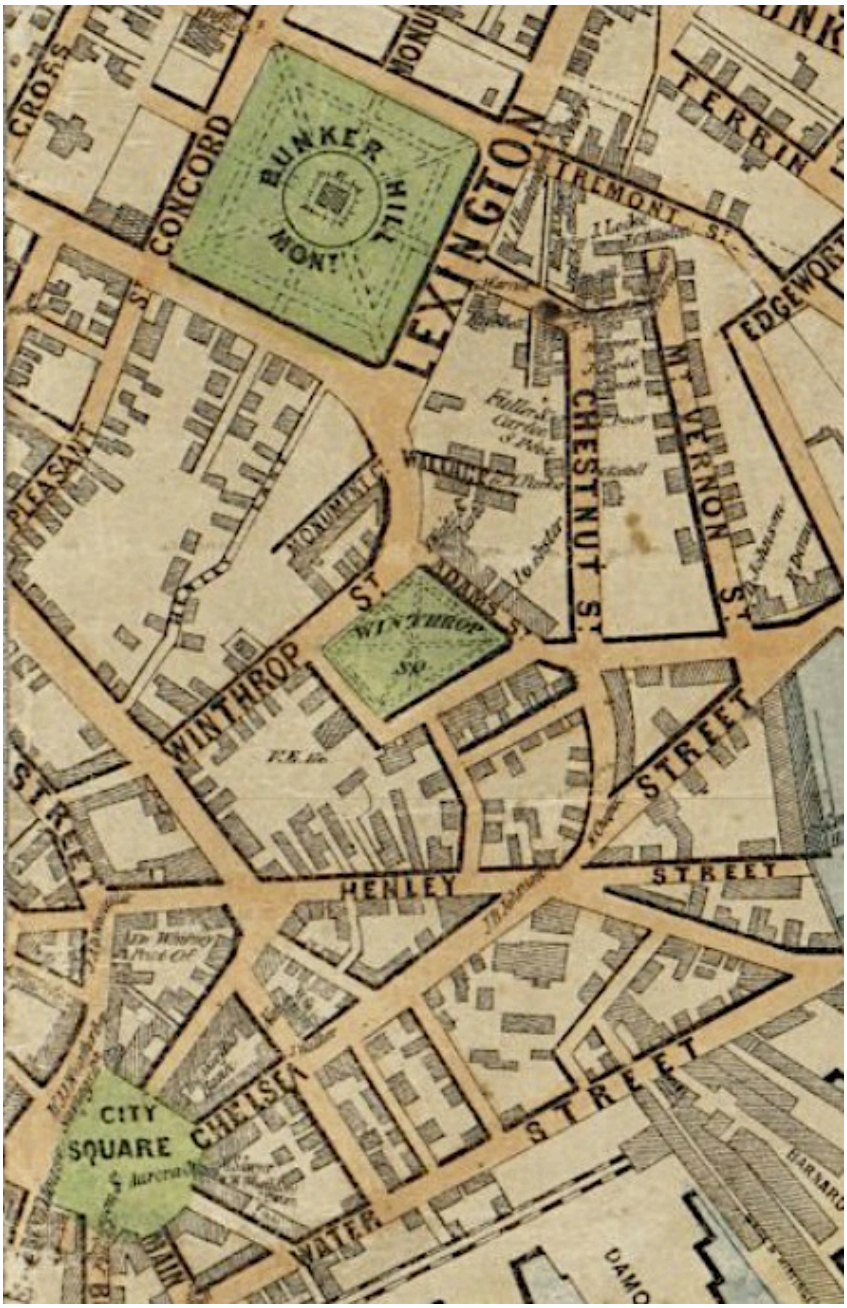

Figure 1.8 - 1852 McIntyre map of Boston showing the Training Field in relation to City Square and the Bunker Hill monument. The three buildings on the Training Field had been removed by this time and the site was becoming more park-like.

Figure 1.9 - 1860s image from the Bunker Hill monument looking south towards Boston shows the Training Field with radiating path system, central fountain, flagpole and light colored fencing around the perimeter.

Figure 1.10 - This ca. 1870 image shows fountain, gravel paths and trees, some of which appear to be American elms. View to the northwest.

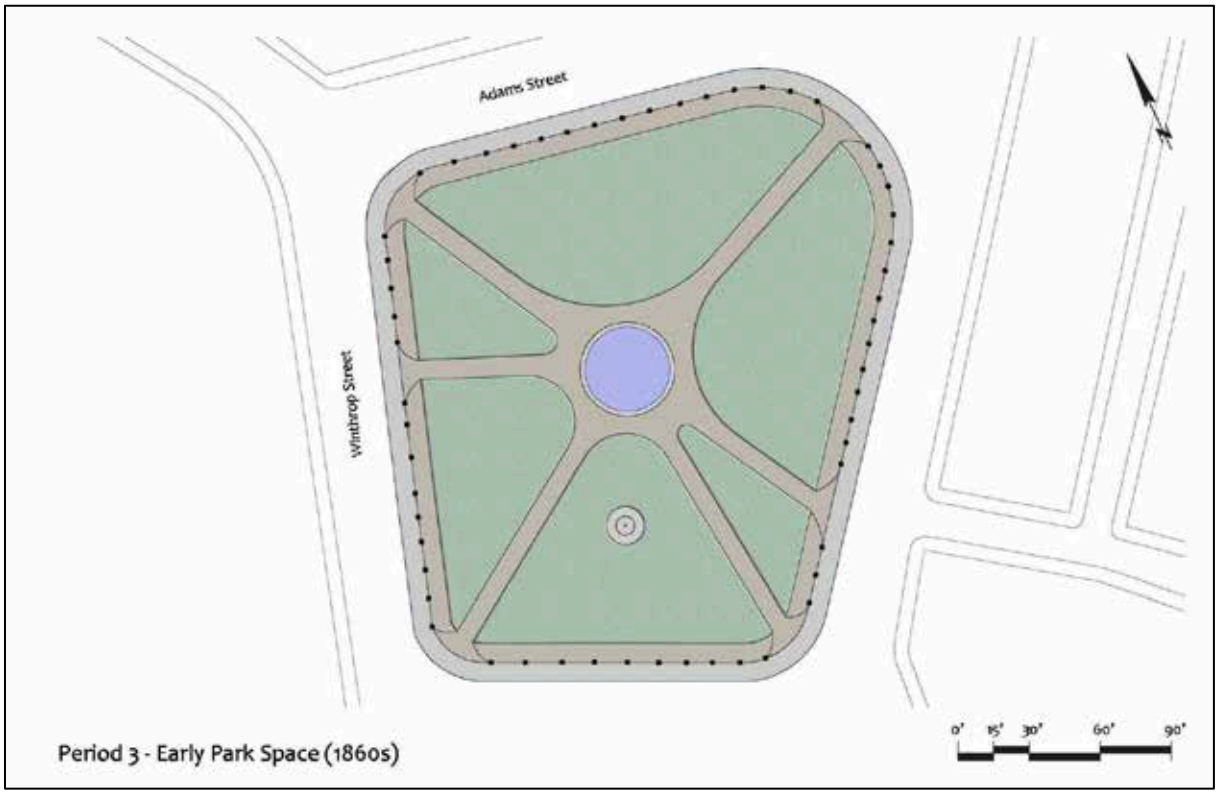

Figure 1.11 - This period plan shows the major built features of the Training Field in the 1860s: radiating paths, perimeter fence, central pool (see photo on previous page) and flagpole in the southern part of the site.

D. COMMEMORATIVE PARK (1872-1919)

The Civil War had a profound impact on Charlestown, which already had a strong tradition of commemorating the Revolutionary War with the Bunker Hill monument. In the early 1870s Charlestown hired Boston sculptor Martin Milmore to design its Civil War monument and chose the Training Field as the location for it. Built of granite from Hallowell, Maine, Charlestown's monument consists of a tall cornice headed plinth with an inscription facing the lawn. Surmounting the plinth is a low platform, which supports three figures: the central female figure is ten feet tall and depicts America crowning two male figures representing the Army and the Navy.

The two bronze tablets mounted on granite piers that are located in the northwest corner of the Training Field were added in 1889. They bear the names of the Colonial soldiers who fell in the Battle of Bunker Hill. The information contained on the tablets was found on payroll records from autumn 1775 that listed the soldiers names and claims for clothing expenses, many made by their widows and heirs. (Interpretive panel: W1)

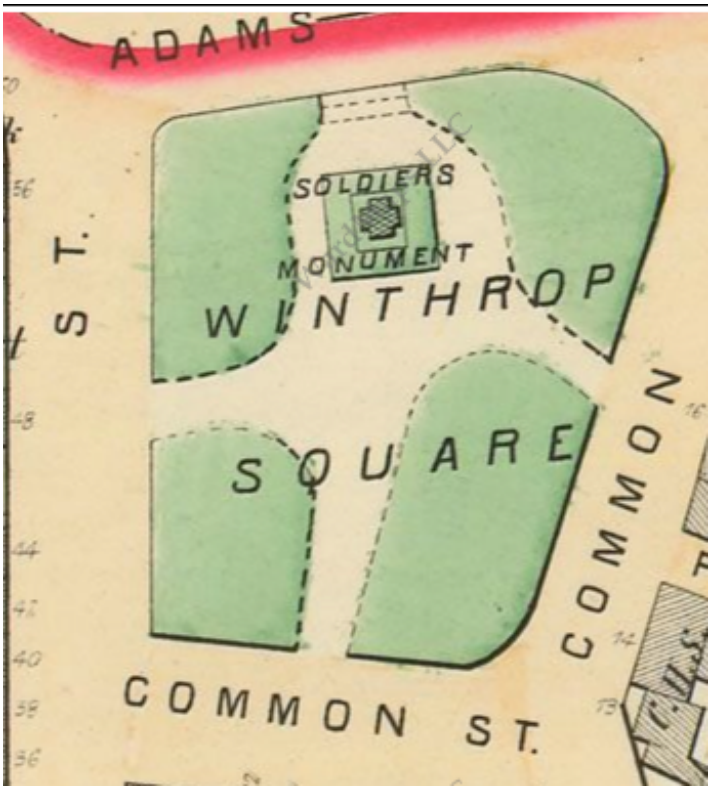

Figure 1.12 - Detail from 1875 Hopkins Atlas of Boston showing new layout of Winthrop Square with the Civil War monument. Compare this with Figure 1.11.

Figure 1.13 - 1875 view of Civil War monument with simple iron fence surrounding it.

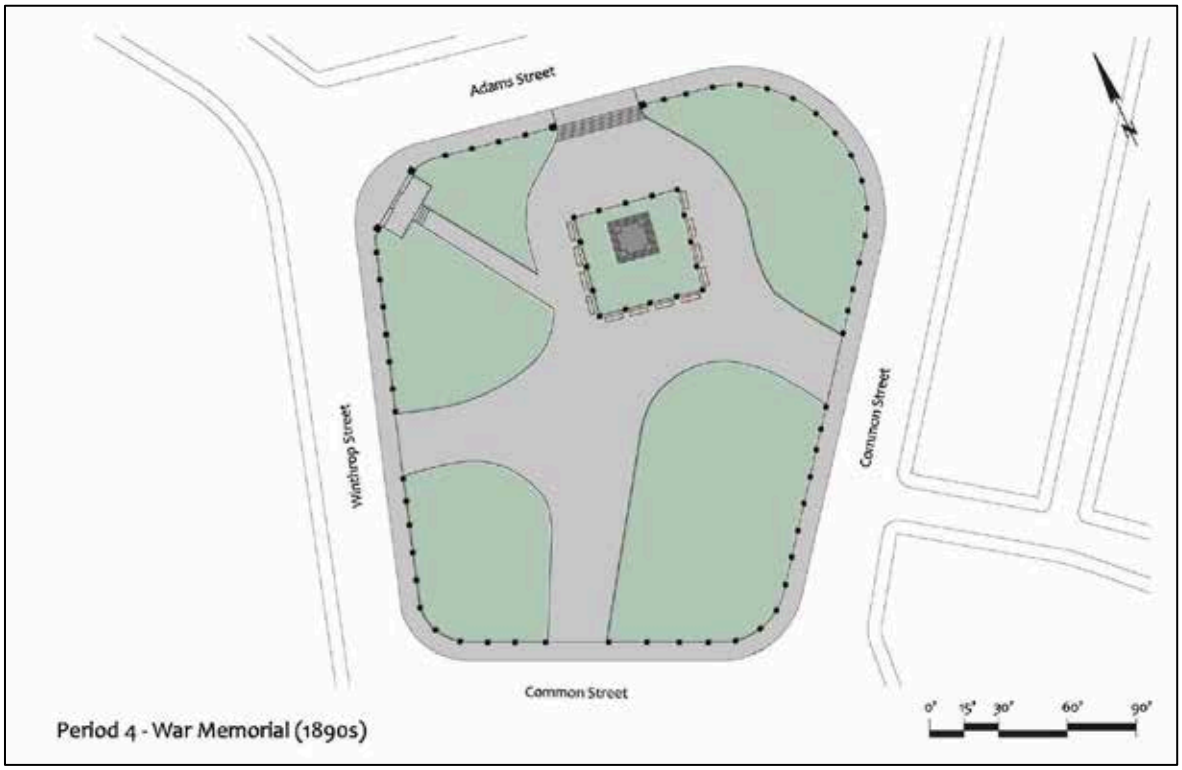

Figure 1.14 - Period plan showing the Civil War monument (1872) in the upper center with the commemorative plaques (1889) at upper left. The path to the upper left was added in the 1890s. These additions transformed the park from an urban square to a commemorative space. Trees are not shown on this plan but appear in photographs of the period.

Figure 1.15 - View ca. 1900. The memorial plaques are visible at the left, and benches have been added in front of the monument.

Figure 1.16 - This ca. 1900 view shows details of the original perimeter fence with granite entry posts and bollards, as well as path system, benches, grass and trees. The park is clearly in good condition at this time.

E. URBAN SQUARE (1919-1950s)

In 1913 the Boston Parks Department assumed responsibility for parks and squares throughout the city, which by this time included many of the outlying communities that had been annexed in the late 19th century. including Charlestown. With centralized administration, there was new emphasis on unifying and standardizing Boston's public spaces. The landscape architecture firm of Olmsted Brothers was hired to do a city-wide survey that included documentation of existing conditions in all the squares, as well as recommendations for each site. (See figures 1.17 and 1.18.)

In 1930 and again in 1942, plans for construction of the Mystic River Bridge (now the Tobin Bridge) called for a connecting ramp that would have effectively marooned the Training Field inside a traffic circle. Strong community opposition, led by the Reverend Wolcott Cutler, rector of St John's Episcopal Church in Charlestown, ultimately resulted in a successful campaign to relocate the ramp and save the Training Field. (Interpretive panel: W3)

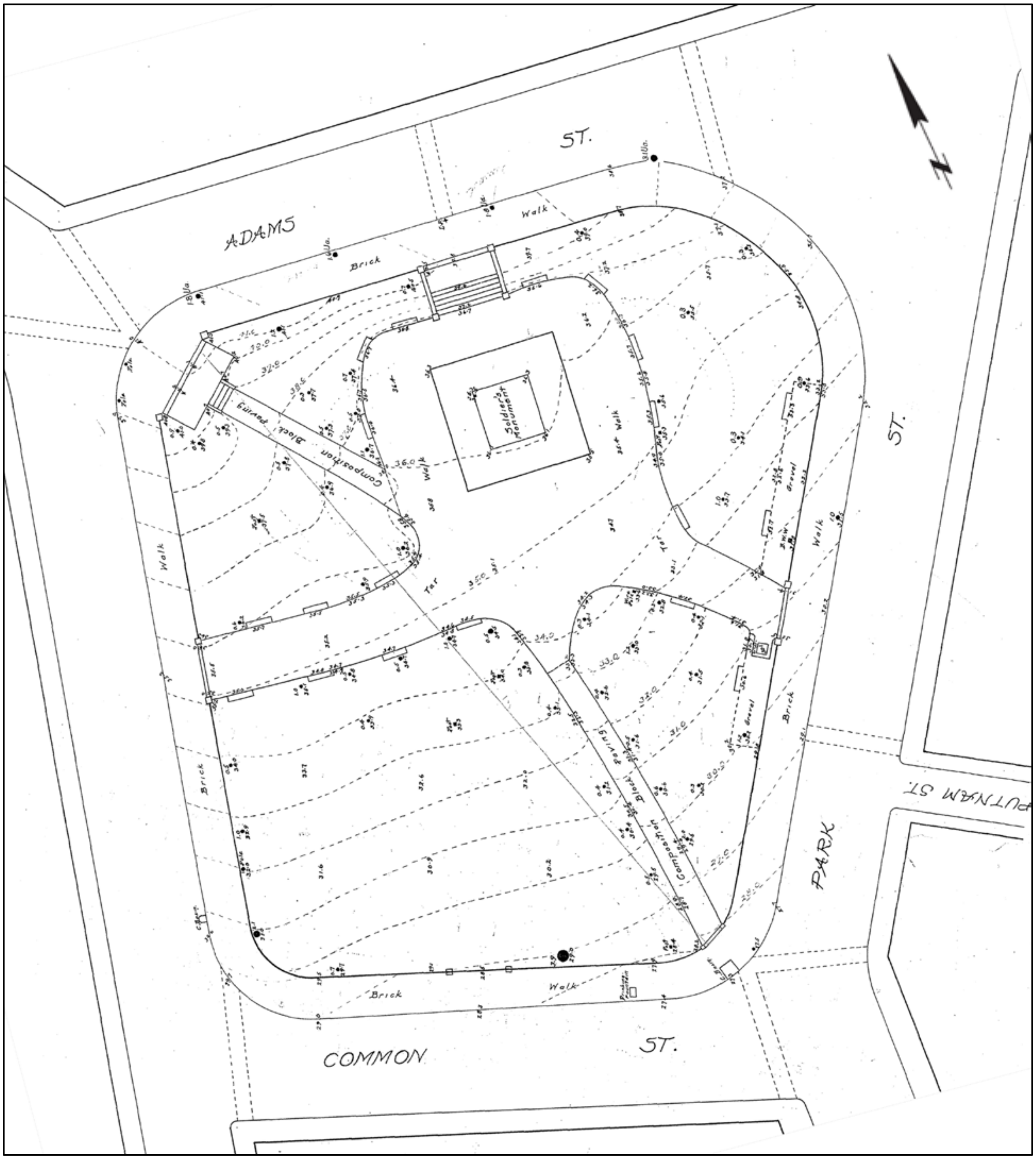

Figure 1.17 - Detail of 1913 existing conditions plan prepared by the landscape architectural firm of Olmsted Brothers as part of a larger study of Boston's squares. The entire path system was changed a few years later. See figure 1.18.

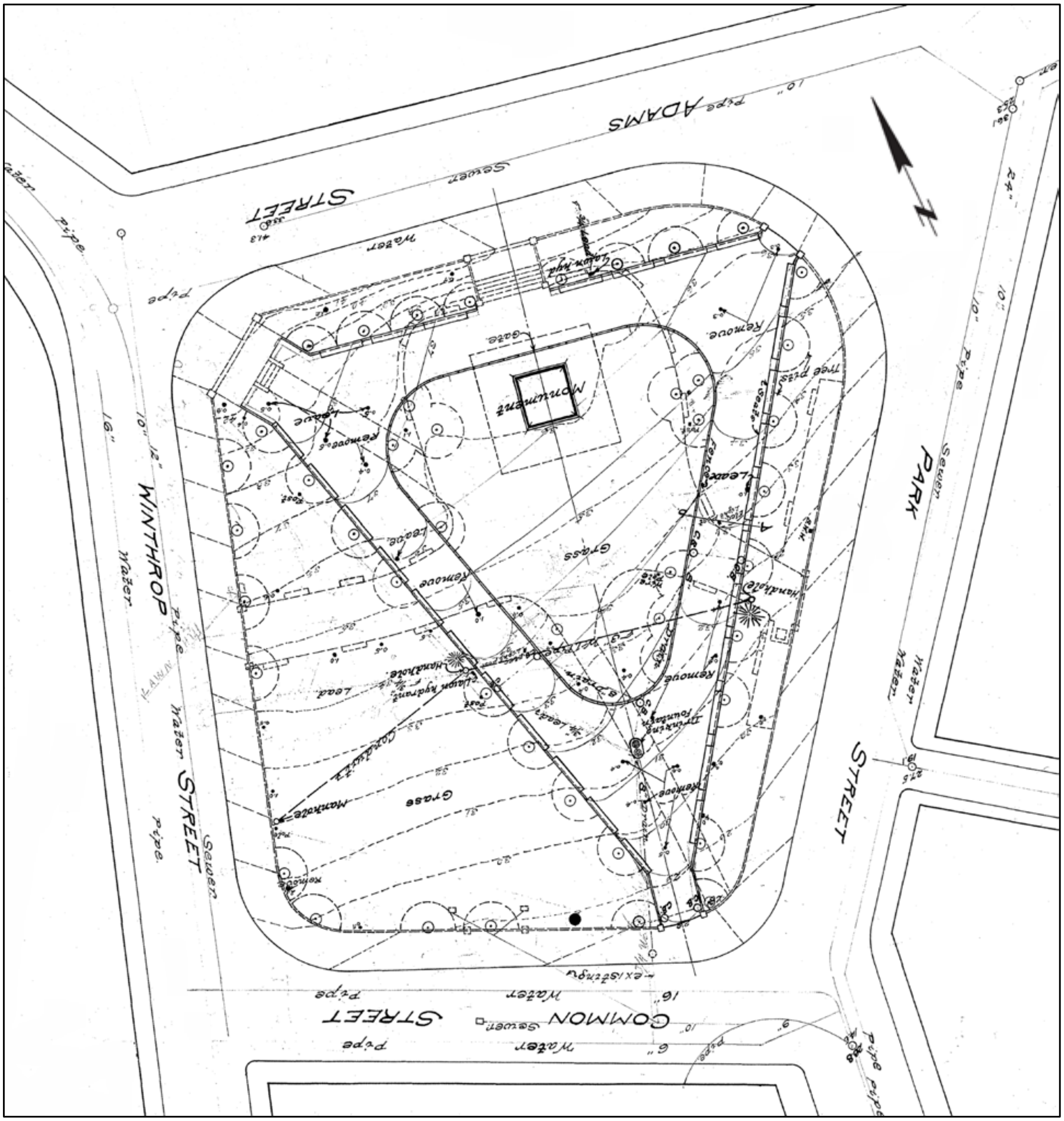

Figure 1.18 - Detail of 1919 City of Boston plan showing proposed alterations to the Training Field. The biggest change was the redesign of the path system, which shows a roughly triangular main path with three entrances at the northern end and one at the southern end. Compare with figure 1.17.

Figure 1.19 - This period plan shows the new design of the Training Field.

Major projects of the 1919 redesign were: reorganizing the circulation system; resodding the entire park; cleaning and repointing the monument; and installing new benches with concrete backs along the main paths. The purpose of the changes was "to make the Training Field a recreation center for adults and not a playground for children." The total appropriation for Winthrop Square's post World War I improvements was $16,000. (BLC Inventory Form)

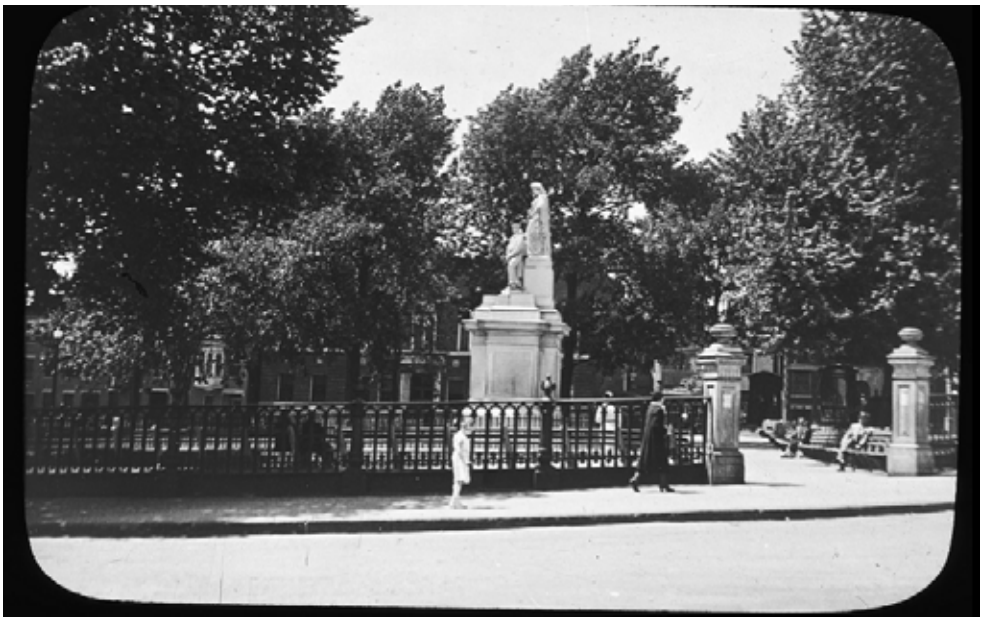

Figure 1.20 - Post 1925. The park remained in good condition through the 1920s. Note the decorative iron fence, continuous benches and heavy tree cover. (BPL Flickr CHA-311-A2)

During the 1930s and 40s there was little money available for maintenance and improvements, so the park began to deteriorate. The handsome perimeter fence (shown below) was damaged by falling trees during the hurricane of 1938 and over time was replaced by the present simpler and more utilitarian fence.

Figure 1.21 – 1944 view of Training Field. Note the decorative fence, which was removed gradually as sections failed. By this time there were fewer benches, placed further apart, and there appear to be fewer trees, some of which are still American elms. (BPL Flickr CHA-313-A1)

Figure 1.22 – 1950 detail in northern section of the Training Field with original fence at right and memorial plaques in the background. (BPL Flickr CHA-311-B2)

Figure 1.23 - 1940 view showing section of replacement fencing around the Civil War monument with Bunker Hill monument in the background. (BPL Flickr CHA-311-A1)

Figure 1.24 - The major changes between 1919 and the 1950s were the gradual removal of the 1872 decorative fence and the addition of a new path in the southwest corner of the park in 1954. Many of the elms died during this period and were replaced by other deciduous trees.

F. CHARLESTOWN'S "OUTDOOR LIVING ROOM" (1950s to present)

In the 1950s, the plan to create a Mystic River Bridge off ramp that would have largely destroyed the Training Field and the surrounding neighborhood was revived. Once again the community prevailed and the ramp was located elsewhere, preserving the park and neighborhood. The 1970s were a tumultuous time for Boston and park maintenance was often deferred. At the same time, Charlestown residents embraced the Training Field, which became an important gathering place for the neighborhood. When city resources were not available, neighborhood groups raised funds for projects such as restoration of the Civil War monument. The Edward Ingersoll Browne Fund provided funds to restore the bronze plaques commemorating Revolutionary War veterans.

In addition to its role as a neighborhood park, the Training Field has become an important stop along Boston's Freedom Trail, which brings many visitors to the area. A recent project undertaken by local civic groups was the addition of three interpretive panels that convey the rich and diverse history of the Training Field to residents and visitors alike. The summer 2013 archaeological investigation, the first done at the park, has already yielded new and intriguing information about the site.

Today the Training Field is one of the most venerable urban parks in America, deeply steeped in the history of the community and the nation. Located in the shadow of the Bunker Hill monument, it is both an intimate community space and the site of nearly 400 years of American history.

G. HISTORICAL AND ARCHAEOLOGICAL SIGNIFICANCE

Areas of Significance

The Training Field is historically significant for its role in the early history of Charlestown and the Battle of Bunker Hill; as an important civic space that has evolved over nearly 400 years; for its outstanding sculpture; as a work of landscape architecture and as an archaeological site.

National Register Criterion A: Broad Patterns of History

Settlement – The Training Field was established by 1640, making it one of Boston's oldest extant civic spaces, with a strong link to the early settlers of Charlestown. While the community has grown around it, the Training Field remains an important open space whose outlines have changed little in nearly four centuries.

Military – The Training Field was an important strategic site in the period leading up to the Revolutionary War and played a role in the Battle of Bunker Hill. It continued to be used as a training field into the mid-19th century and is one of the few surviving Massachusetts training fields, an important early New England property type. The Civil War monument and the tablets honoring Revolutionary War soldiers also make it an important place of military commemoration.

Community Planning – The Training Field has been a constant element around which Charlestown has evolved to meet the changing needs of the community. It is one of Boston's oldest extant civic spaces that has continued primarily as an open space while also accommodating other needs of the community such as fire house, school and munitions storage, as well as urban park, commemorative space and historic site.

National Register Criterion C: Art and Design

Art – The Civil War monument is a work by Martin Milmore, one of Boston's best-known 19th century sculptors, who was particularly recognized for his Civil War memorials. The bronze commemorative plaques reflect another 19th century artistic tradition.

Landscape Architecture – The Training Field is an excellent example of an important civic space that has evolved in response to changing needs of the community while retaining elements from its past. The early use of the site was based on vernacular traditions, while late 19th and early 20th century modifications reflect landscape architectural styles of their period.

National Register Criterion D: Archaeology

Prehistoric and Historic Archaeology – The earliest documented use of the area was by Native Americans who occupied Charlestown prior to European settlement. While the presence of native people in the vicinity of the Training Field has long been assumed, the first physical evidence was unearthed by the Boston City Archaeologist in fall of 2013. These investigations revealed that there is a rich archaeological legacy under the ground of the Training Field, most of it located well beneath the current surface. Any proposed site modifications with potential to impact archaeological resources would require a permit from the City Archaeologist. Note: see report by City Archaeologist in Appendix C.

Period of Significance

The Training Field was first noted in Charlestown records in the 1640s as a "well-established public place" although it may have been in use informally before that. (Interpretive Panel: W2 Landscape) It has been in continuous use since then, evolving over time to meet various civic functions of the community. Thus the Training Field reflects nearly 400 years as a public open space. Its history dates from ca. 1640 to the present and it is one of the few public open spaces in New England to be in continuous use for this long. Thus the period of significance extends from ca. 1640 to 1964, the-50 year cutoff established by the National Register of Historic Places.

Integrity

Integrity is the authenticity of a landscape's historic identity, as evidenced by the survival of physical characteristics that existed during its historic or prehistoric period. It is also the extent to which a property retains its original historic appearance. In the case of a historic landscape, Integrity can also be linked to continuity of use, which is the case for the Training Field, as it has continued to serve as a public open space for the Charlestown community, while evolving in its physical details. The present landscape design of the Training Field dates largely to the early 20th century, but also integrates important late 19th century features such as the Civil War monument and the Revolutionary War plaques.

Character Defining Features

A character-defining feature is a prominent or distinctive aspect or quality of a cultural landscape that contributes significantly to its physical character. This is a summary of the major character defining features of the Training Field. There is a more complete list of park elements in Appendix B.

Topography – Unlike most small urban squares, which are relatively flat, the Training Field has a fairly steep slope with the Bunker Hill monument located a block uphill from the highest corner.

Spatial Organization – The arrangement of features within the landscape has evolved over time but the spatial organization has remained relatively unchanged since the 1919 redesign, representing a continuity that extends over nearly a century.

Circulation System – The current path system has been largely in place since the 1919 redesign, except for the path to the southwest corner, which was added ca. 1954.

Vegetation – The general character of the vegetation consists of grass and large deciduous trees. The trees, which were originally American elms, are now multiple species. They are fairly evenly spaced around the perimeter of the park and more irregularly spaced on the interior. This general approach to tree planting has remained in place since the Training Field became more park-like in the 1860s.

Public Art – This category includes the Civil War Monument (1872) by sculptor Martin MiImore and the Revolutionary War Bronze Tablets (1890s). These artistically and symbolically significant works are important focal points of the park.

Fencing, Railings, Pillars and Bollards – There has been fencing around the perimeter of the Training Field since at least the mid 19th century. The earliest fences around the Training Field were most likely post and rail fences around the entire Training Field. Figure 1.6 show what appears to be a vertical board fence in front of the Training Field School in the 1830s, which would have made sense to contain the children. Ornate iron fencing with granite posts at major entrances dates to the late 19th century, but has largely been replaced with simpler contemporary metal fencing that is consistent with current Boston Parks and Recreation Department standards for historic parks. All major entrances except the southwest entrance, which was added later, are marked by granite pillars and iron bollards to prevent vehicular access.

Curbing – There is low concrete curbing adjacent to the fence around the grassy area where the monument is located. Low granite curbing exists at the northern edge of the upper path.

Park Furnishings – The Training Field has had a large number of benches since the mid-19th century. All of the current park furnishings (benches, lights, signage, trash receptacles, drinking fountains) are modern features. Some of these are more compatible with the character of the park than others. Note: see discussion of park furnishings in next chapter.

2. SITE ANALYSIS AND RECOMMENDATIONS

A. APPROACH

The Training Field has undergone many changes during its nearly 400 years, each of which is part of the overall history of the site and the Charlestown neighborhood, and each of which contributes to the historic significance of the site. The recommended preservation treatment for the Training Field is rehabilitation, which is defined by *The Secretary of the Interior's Standards for the Treatment of Historic Properties* as "making possible an efficient compatible use through repair, alterations and additions while preserving those portions or features that convey its historical, cultural and architectural values." This approach, which is the one most commonly used for historic landscapes, recognizes the overall history of the park and the cumulative importance of the various features found there. It also includes recommendations that improve the utility or function of the site.

This chapter describes problems identified during the site investigation phase of the project and offers proposed solutions. The recommendations address problems at several levels. Some are straightforward issues that can be resolved by maintenance activities, such as cleaning catch basins or pruning trees. Other problems must be addressed through expenditure of capital funds as part of a larger rehabilitation of the park. Still other problems are policy and management issues that affect care and use of the park rather than physical changes.

These recommendations will be used for planning and budget purposes and will serve as an outline for detailed design and construction drawings that will guide the overall rehabilitation. An essential assumption is that stewardship of the park must be responsive to the needs of the park's multiple user groups, including neighborhood residents and visitors to Charlestown's historic sites.

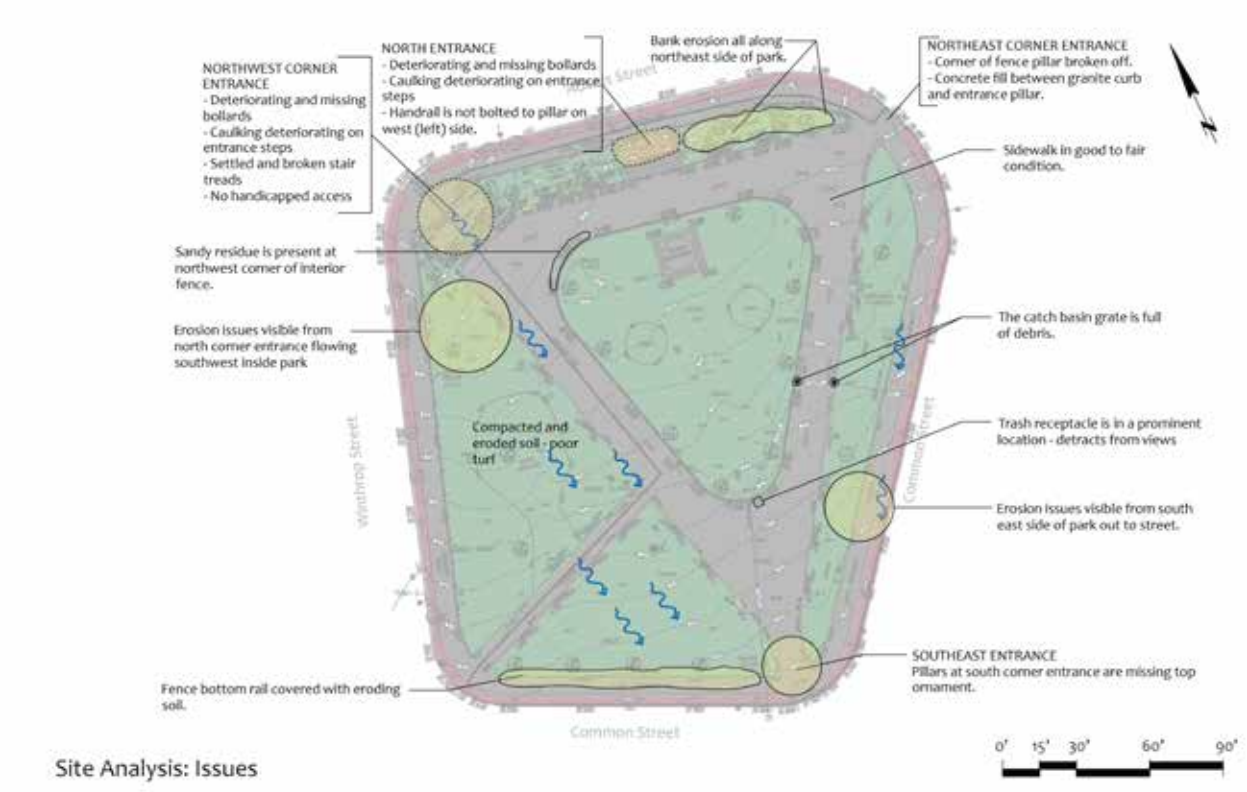

Figure 2.1 - Summary of site analysis issues for the Training Field.

B. DRAINAGE AND EROSION

Drainage and Erosion Issues

Drainage is one of the most pressing problems at the Training Field for several reasons. The site is located on a steep slope and water from uphill, especially the northwest corner, runs into the park from the surrounding neighborhood, causing flooding and erosion. Secondly the drainage system does not work properly because catch basins are clogged, poorly located or inadequate. This problem is exacerbated during the winter months when piles of snow block the flow of runoff, particularly in the southwest corner of the park.

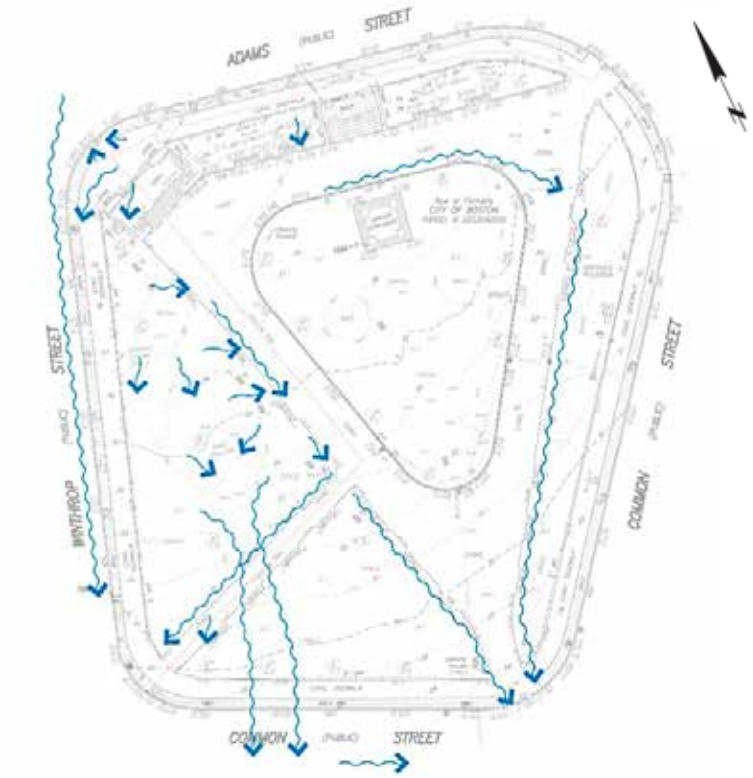

Figure 2.2 - Diagram of current water flow through the Training Field.

Figure 2.3 – Runoff during a storm.

Figure 2.4 – Erosion along path system.

Drainage and Erosion Recommendations

Poor drainage is one of the most fundamental issues at the Training Field because it impacts so many other aspects of the park. Measures to improve the drainage include some tasks that must be undertaken on a regular basis, such as cleaning catch basins, while other drainage issues require a multi-facet approach of re-grading areas, adding drainage structures and improving the soil conditions to limit water runoff.

- Add catch basins in key locations to capture storm water before its large volume causes erosion. Add catch basins to prevent drainage that causes icing problems on the walks.
- Clean catch basins in the Training Field and its immediate surroundings, particularly those uphill from the park.
- Re-grade areas to direct storm water into drainage structures or toward the intended path of flow.
- Any plans for substantial excavation require a permit from the City Archaeologist to insure subsoil archaeological resources are not disturbed

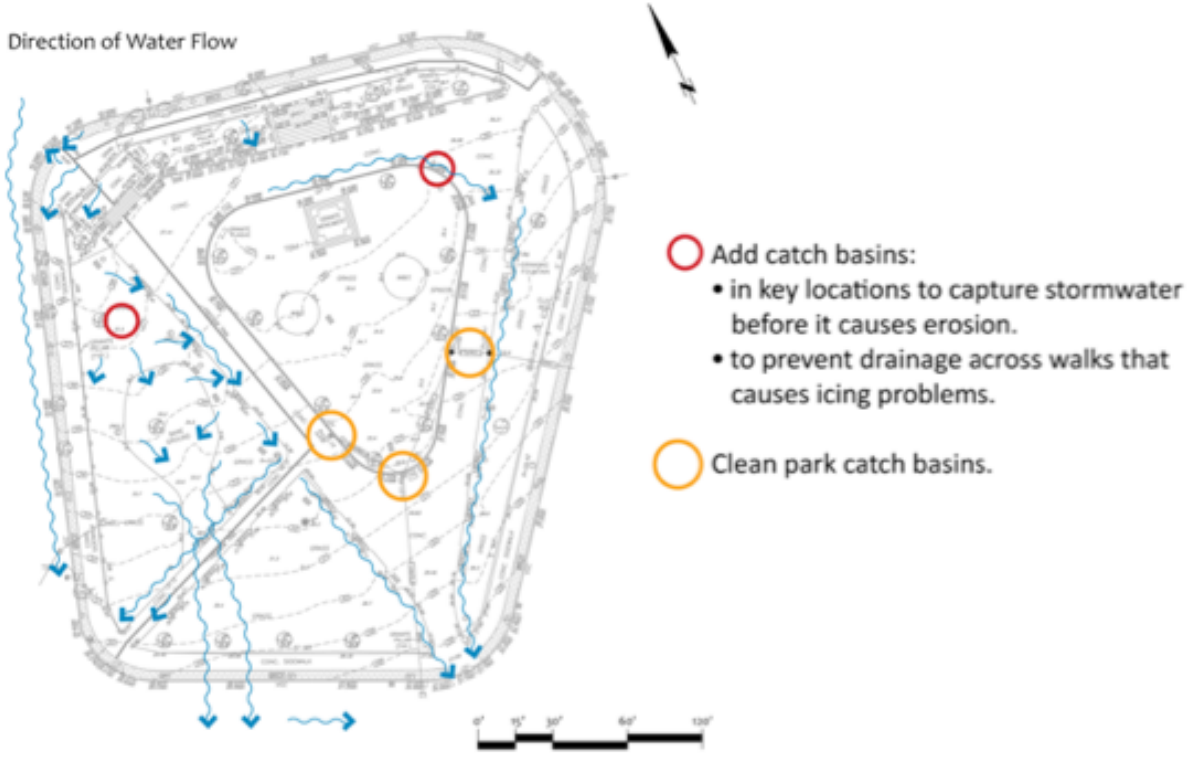

Figure 2. 5 - Recommendations: Drainage and Erosion

C. SOILS

Soil Issues

Related to the issue of drainage and runoff is the poor quality of the soil at the Training Field, which is one of the site's most pressing problems. The Training Field, like most urban parks, has soils that are highly compacted, lack organic matter, are eroded and have low fertility. In conjunction with this Cultural Landscape Report, the Boston Parks and Recreation Department commissioned a detailed soil health assessment report and heavy metal testing, which were undertaken in summer 2013 by Dr. Charles Sherzi to identify specific problems and make recommendations for soil remediation. The study divided the site into six areas, which are shown on the map and summarized below. Dr. Sherzi's full report is Appendix D of this Cultural Landscape Plan.

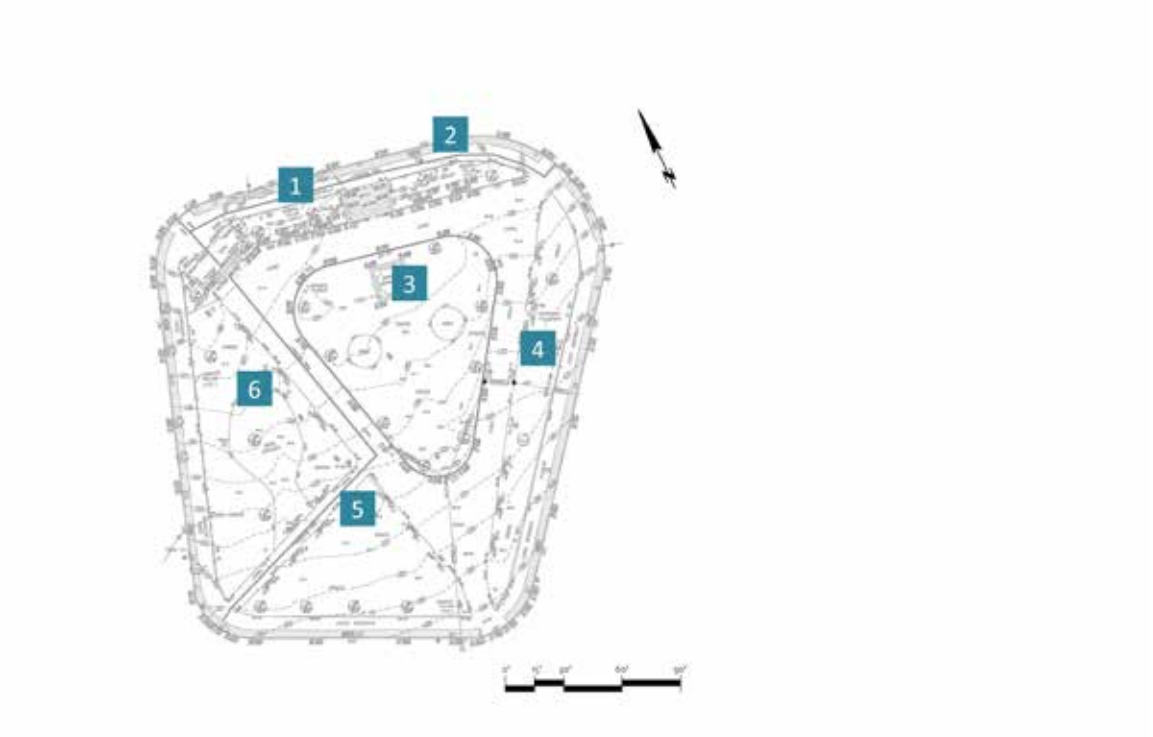

Figure 2.6 – Soil Health Test Areas

- Two of the areas (1 & 3) received an **overall quality score** of **medium** with the remaining four areas receiving a **low** quality score.
- All areas have **good stable aggregates** and high available water capacity.
- Surface (0 - 6" deep) and subsurface (6 – 18" deep) soils are **significantly compacted** around site.
- Soil **microbial activity is marginalized** around site due to low amount of active carbon (fresh organic residues).
- The **amount of heavy metals** in all areas is **below** the **maximum allowable concentrations**.
- Many areas exhibit signs of **soil erosion and exposed roots**.

Soils Recommendations

Dr. Sherzi's report describes the major underlying constraint as soil compaction at both the surface and subsurface levels. It recommends that a first priority is to address soil compaction issues, which will "contribute to a beneficial aerobic soil environment and improve growing conditions at the site." Following that, additional remediation should include a variety of soil amendments to increase the fertility of the soil, to provide a continuing stream of nutrients and to help restore a stable pH. In order to improve the quality of the turf and the overall health of the trees within the park, correction of the soil deficiencies are critical to address. Dr. Sherzi also provided the following specific recommendations:

Address soil compaction issues through:

- Air spading
- Vertical composting
- Radial trenching

Add dry and liquid soil amendments during remediation and annual maintenance:

- Compost
- Mineral amendments, rock dusts, and powders
- Bio-char
- Green manure or cover crop
- Liquids (fish hydrolysate, molasses, kelp, humic acid)

Maintenance:

- Top dressing of compost
- Seasonal applications of organic fertilizer & fungal foods
- Late summer/early fall core aeration

Figure 2.7 – Erosion along the main walkway shoulders.

Figure 2.8 – On the east side of the park, water drains south and out to the street.

D. VEGETATION

Vegetation Issues

The plantings at the Training Field have evolved over time, but generally there has been a simple palette of deciduous shade trees and lawn. The trees shown in 19th century photographs (see Chapter 1) were primarily American elms, which were valued for their graceful vase-like form. Since the arrival of Dutch elm disease in the early 20th century, a variety of tree species have been planted at the Training Field. Most have been large deciduous trees such as London planetrees, zelkovas and pin oaks, which are consistent with the original design intent at the Training Field.

There are also currently a number of Norway maples at the Training Field that pose a problem because their dense shade and shallow roots prevent grass from growing underneath. Norway maples are also weak wooded trees susceptible to storm damage and are very weedy due to the large number of seeds they produce. The present diversity of tree species is appropriate to prevent wholesale loss due to pests or disease, but some of the species found at the Training Field are not strong wooded trees (i.e. flowering pears, silver maple and Norway maple). Also, the perimeter trees growing in tree pits exhibit signs of stress due to urban conditions and insufficient soil volume.

More recently a few smaller flowering trees have been planted as infill and around the perimeter on the west side. There is also one spruce tree in the southern part of the Training Field, which was planted in the late 20th century as a commemorative tree. Shrubs, flowers and other small-scale ornamental plantings have traditionally not been part of the Training Field landscape, although there have been some small-scale plantings periodically in front of the monument. The quality of the lawn varies depending on the location within the park. The central lawn panel, which is enclosed by a fence, is in good condition, while the other lawns in the park are very sparse due to heavy use, compaction, dogs and lack of water.

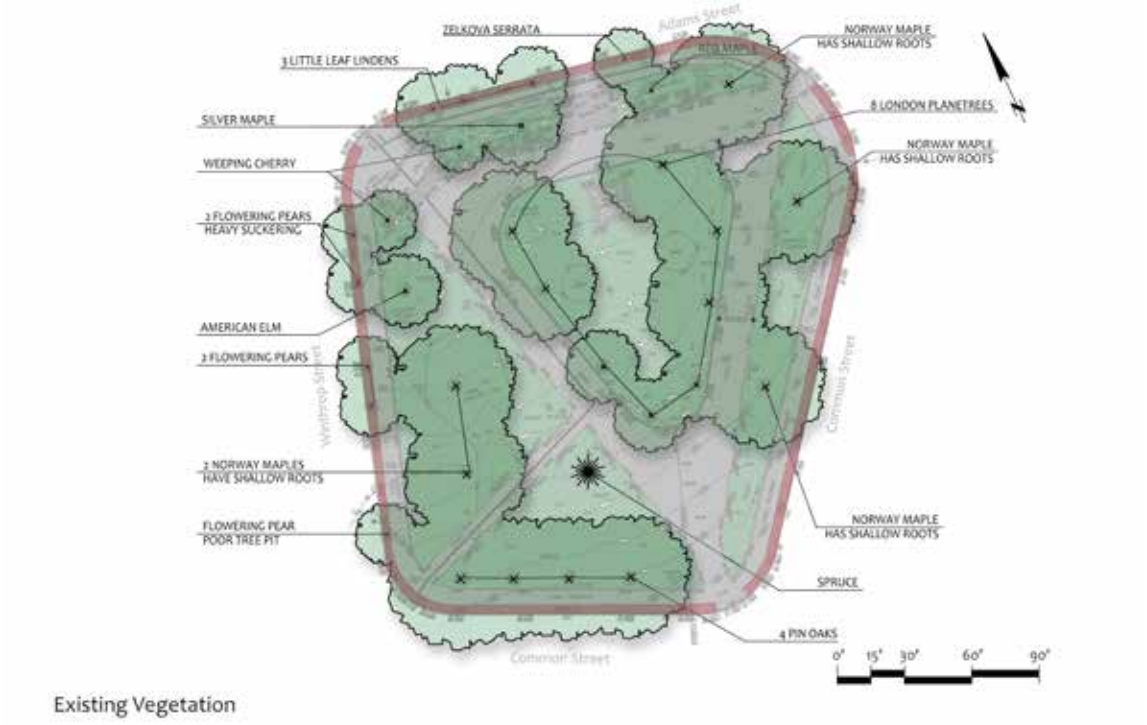

Figure 2.9 – Existing Vegetation, 2013.

Figure 2.10 – Sucker growth impedes pedestrian travel and is unsightly. Brick pavers in tree pits are heaved by tree roots.

Figure 2.11 – Many shallow-rooted trees can buckle sidewalks, cause mowing or tripping hazards, prevent other vegetation – including lawn – from growing under them, and contribute to soil erosion.

Figure 2.12 - A spruce exists in the southern center portion of the training field. It blocks views and was not part of the historic landscape.

Figure 2.13 – London Planetrees punctuate the central lawn and monument area.

Vegetation Recommendations

One of the most visible and pressing problems at the Training Field is that the turf and trees are in poor condition. The recommendations here include a combination of soil treatment (see previous section) and other actions to improve the health and appearance of the vegetation. The critical first steps that must be undertaken to improve the health of the vegetation include:

- Install an irrigation system for turf areas.
- Re-seed turf areas once soil amendments have been completed.
- Prune Norway maples heavily to thin canopy of trees and allow more light to reach the underlying turf.
- Prune sycamores for the protection of the monument and for unobstructed view of it.
- Plant deciduous trees to fill in holes on the east side of the Training Field. These should be large scale specimen trees (similar in scale to the London planetrees and other trees within Training Field)
- Replace trees as they decline or fail, but do not add more trees that increase the density of tree planting within the park.
- Avoid small ornamental trees that are not consistent with the palette of large deciduous trees and turf.

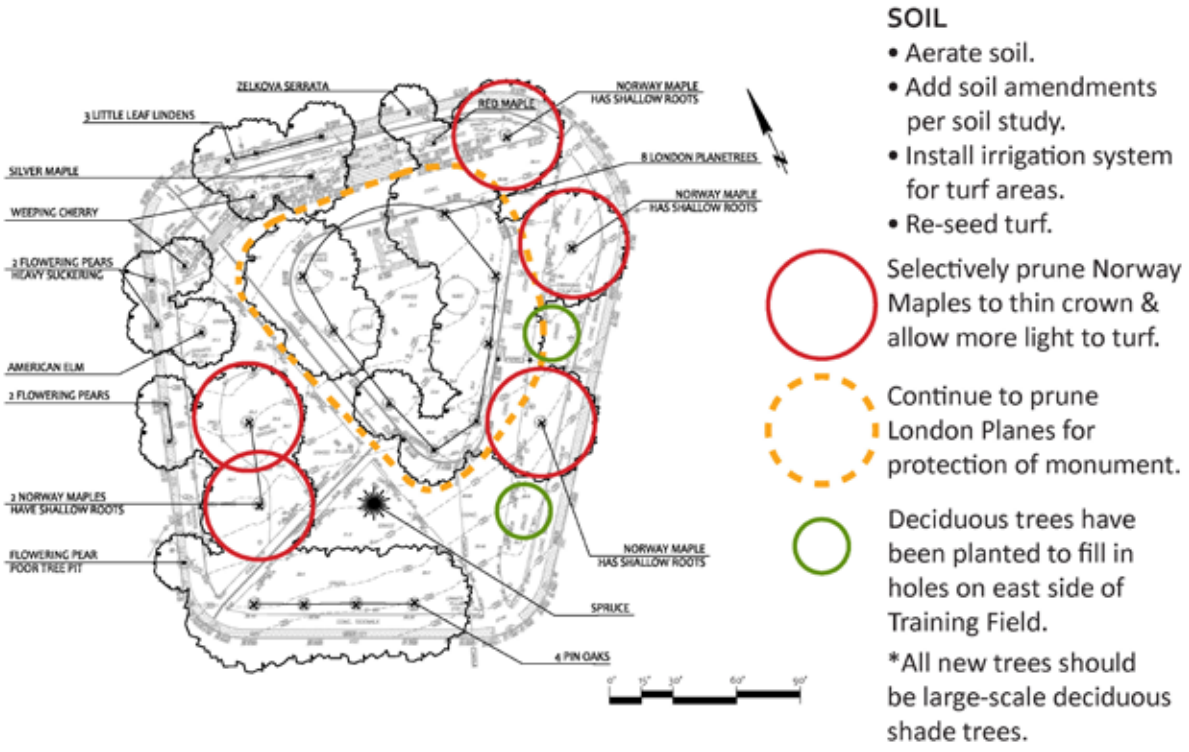

Figure 2.14 - Recommendations: Vegetation

E. HARDSCAPE

Hardscape Issues

Hardscape is the built elements of the park landscape, consisting primarily of pavement, curbs and fencing. Most of these features are relatively modern replacements for earlier park hardscape and they are generally compatible with the historic character of the park. The park walkways are primarily concrete pavement, which is generally in good condition. The Freedom Trail, delineated with a narrow brick line, passes through the site. Granite curbs edge the sidewalks along the Adams Street part of the park and a concrete curb edges the interior perimeter lawn panel around the monument. The steel fencing around the park perimeter and around the interior lawn panel is in poor condition with numerous damaged or missing components. The paint has failed on the fencing and may have lead paint given its age.

Figure 2.15 - The concrete curb at the base of the central fence has heaved and cracked.

Figure 2.16 – The brick Freedom Trail pavement is cracked in many areas.

Figure 2.17 - Bricks highlight entries.

Figure 2.18 - Granite curbs border walks in the northern portion of the park.

Hardscape Recommendations

Most of the current hardscape is modern replacement of earlier park hardscape, which is generally compatible with the historic character of the park. Historic masonry elements of hardscape are addressed in Section F because these features, most of which are granite, require specialized care.

- Replace the concrete curb under the fence around the monument with granite curbing to be a more durable material, consistent with the other small-scale park curbs, and more in keeping with the significance of the monument.

- Replace the interior fence around the monument with historically appropriate fence: reconsider curb base.

- Add low park-scaled granite curb along main walks to direct storm water and to better define lawn edges.

- Widen southwest diagonal path to 12' to provide adequate width for current pedestrian traffic and to provide access for snow plowing equipment.

- Add granite pillars to give the southwest entrance the same stature as at other entrances. The design of these should be compatible with the older pillars but not necessarily the same.

- Replace missing granite urns on top of pillars at southeast corner.

- Replace the exterior fence with a historically appropriate fence, and reconsider the curb base in the northeast corner of the park. General approach should be to have fence that is of roughly similar height as earlier fence, relatively heavy duty and sturdy.

- Study settlement and cracking at granite steps. Replace sealant on the steps if required.

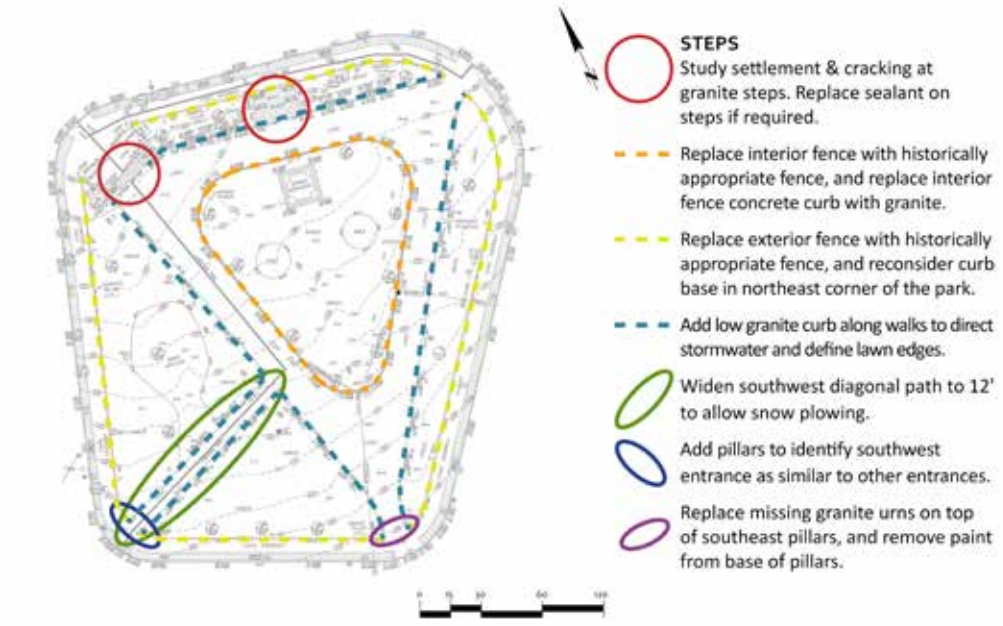

Figure 2.19 - Recommendations: Hardscape

F. MASONRY

Masonry Issues

This section of the recommendations addresses the masonry elements of the Training Field, which include functional features such as steps and piers, as well as works of art such as the monument and the bronze plaques in the northwest corner of the park. Many of the masonry elements within the Training Field are made of historic Hallowell granite and require special care.

The masonry features have been evaluated by stone conservator Ivan Myjer, who has prepared specifications for the following:

- Replace missing granite urns on top of pillars at southeast corner.
- Revolutionary War monument: granite tablets with bronze plaques (northwest corner of park).
- West entry stairs at tablets; center entry stairs and granite piers (Adams Street).
- Northeast entry granite piers (Adams and Common Streets).
- South entry granite piers (Common and Park Streets).
- Granite bases at perimeter fencing and Freedom Trail bricks.

Figure 2.20 – The two bronze plaques in the northwest corner of the Training Field commemorate Revolutionary War soldiers.

Figure 2.21 - The recently restored soldiers and sailors monument by sculptor Martin Milmore is the focal point of the Training Field.

Masonry Recommendations

This section addresses the granite elements of the Training Field, which include functional features such as steps and piers, as well as works of art such as the monument and its base. In September 2013 stone conservator Ivan Myjer, who recently restored the soldiers monument and northeast granite piers, prepared recommendations for the remaining masonry elements at the Training Field, which are summarized below. See more detailed recommendations in Appendix D.

Soldiers Monument

- Rinse monument with water, apply Prosoco Biowash, then rinse again.
- Repair five larger spalls at north elevation base and steps using granite dutchmen obtained from the historic quarry.

Granite piers with bronze tablets at the northwest entry to park

- Cut and repoint mortar joints as per specifications in Appendix A.
- Clean granite using Prosoco Biowash.

West Entry Stairs at Tablets and Freedom Trail Bricks

- Replace frost damaged bricks using matching bricks.
- Remove failed sealant and mortar and install new mortar.
- Clean granite to remove staining.

Center Entry Stairs and Granite Piers (mid-Adams St.)

- Remove failed sealant and mortar and install new mortar at steps.
- Clean granite to remove staining.
- Install original finials at piers. Finials may require the removal of ferrous pins as well as the repair of cracks caused by the expansion of corroding ferrous pins.
- If original finials cannot be located, replicate finals from Hallowell Granite:

South Entry Granite Piers (at Common and Park Streets)

- Install replacement urns and finials at piers. Remove paint at base of west pier. obtained from the historic quarry.

G. PARK FURNISHINGS

Park Furnishings Issues

Park furnishings are small-scale functional elements within the Training Field that include lights, benches, trash receptacles, bollards and signage. All of the park furnishings at the Training Field are modern elements. Some, such as the bollards and benches, retain a traditional style. Others are contemporary in design.

Figure 2.22 – Varnish on the wood bench slats is failing and the benches lack wheelchair companion space.

Figure 2.23 - Water fountain is modern in appearance and does not drain to a piped system.

Figure 2.24 – Numerous bollards are missing and others are in poor condition.

Figure 2.25 - Solar compacting trash receptacles are in visually prominent locations and do not fit the historic aesthetic of the park.

Park Furnishings Recommendations

Park furnishings at the Training Field are modern elements within the landscape that enhance visitor enjoyment and use of the park. They should be subordinate to the overall design of the park and as unobtrusive as possible. Furnishings should be simple in design, durable and complementary to the historic park setting. Locations of drinking fountains and trash receptacles, for example, should be practical, but discreetly located so that they are subordinate to important viewsheds within the park.

- Accessible drinking fountain should be cast iron, painted black, drained to a dry well or sewer.
- Paint light poles black.
- Paint stair railings in northwest corner and north center of park.
- Replace the deteriorated cast iron bollards with ones of a similar design.
- Remove the trash receptacles from visually prominent locations. Replace with new solar compacting models painted black.
- Refinish wood slats on benches or consider replacement with wood that does not need varnish.
- Replace park identification and regulatory signage at the park perimeter and within that is similar to other historic parks in Boston.

Figure 2.26 – New interpretive signage with cast iron urns.

H. UNIVERSAL ACCESS

Universal Access Issues

The site has universally accessible entries and walkways with the exception of the stairs at the two Adams Street entries. Since alternative access points are provided, the addition of ramps to bypass the stairs is not required. A ramp at the northwest entrance could benefit families who wheel strollers into the site should be considered.

Figure 2.27 - Northwest corner and north entrances are not universally accessible due to steps. Bricks indicate Freedom Trail route.

Figure 2.28 - Barrier free access.

Universal Access Recommendations

- Study accessible route and stroller access to bypass stairs at northwest corner of park.
- Add companion wheelchair space beside percentage of benches.

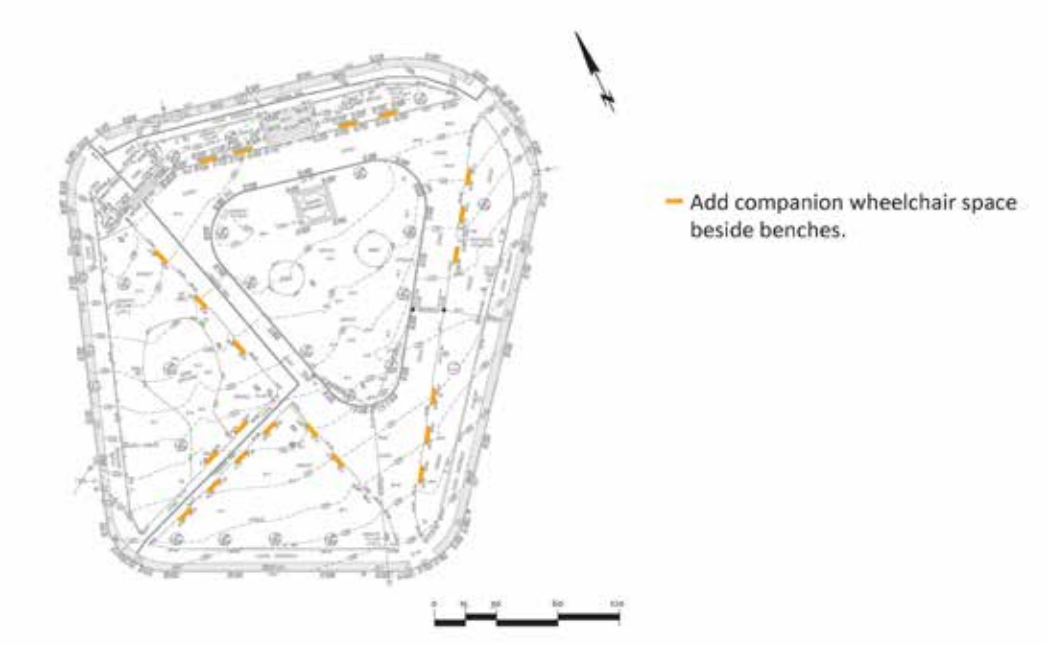

Figure 2.29 - Recommendations: Universal Access

I. ARCHAEOLOGY

The first archaeological investigation of the Training Field was undertaken in fall 2013 by City Archaeologist Joe Bagley, working in cooperation with the Boston Parks and Recreation Department and the Charlestown Preservation Society. The archaeological survey was conducted over a period of three weeks by a team of volunteers from the city archaeological program and local community members. A total of 48 shovel test pits were excavated (see map below). The test pits were supplemented with ground-penetrating radar, a non-invasive sensing technique. While artifacts are still being catalogued, it is likely that there will be roughly 5, 000 to 10,000 covering the period from early Native American use to the present. These will yield new information about the history of the Training Field. The presence of such a rich collection of artifacts, is an exciting find that must be taken into consideration in planning future improvements at the Training Field. Thus any proposed work that involves ground disturbance, will require review by the City Archaeologist. See Appendix C for more detailed information about Training Field archaeology.

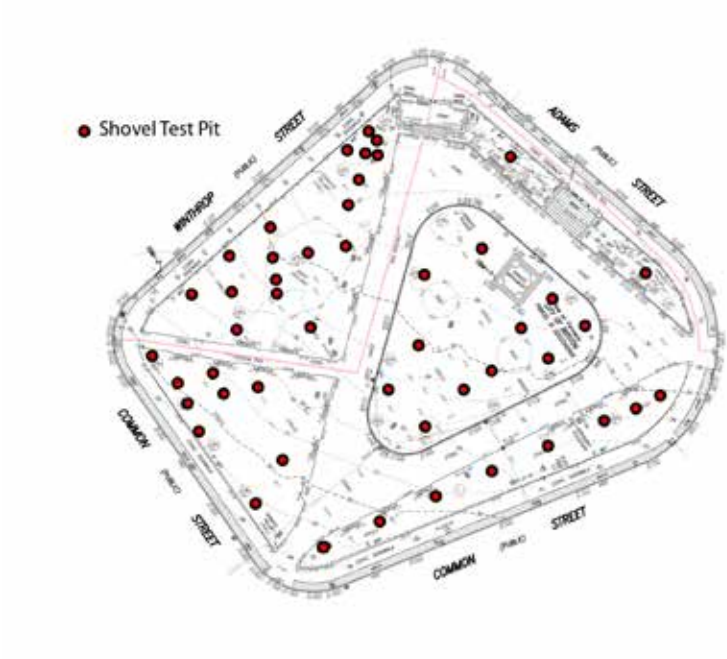

Figure 2.30 – Location of test pits.

Figure 2.31 & 2.32 – Sample findings: stone flake and button.

J. CONCLUSIONS AND NEXT STEPS

Preservation Treatment

Chapter 1 of this report includes a detailed history of the Training Field and a summary of its overall historical significance, including areas of potential National Register eligibility, period of significance, integrity and character defining features. Chapter 2 describes each of the physical features within the Training Field, identifies current physical and functional issues associated with each, and offers specific treatment recommendations. These fall under the overall approach of rehabilitation, which is defined by the *Secretary of the Interior's Standards for the Treatment of Historic Properties* as:

> *" . . . preserving those features or aspects of a property that are important in defining its significance (character defining features) but allowing changes that improve the utility or function of the property. This is the most flexible treatment, as it allows modifications for contemporary use and permits the restoration of important features where doing so is critical to the historic character of the property."*

Within the overall treatment of rehabilitation, the following objectives provide an additional framework for decision-making that is specific to the Training Field.

- Preserve extant features, especially those listed in Chapter 1 as character defining features. Where possible eliminate later non-contributing features that are not essential for site operations.

- Make modifications to support effective maintenance with limited resources. For example regular cleaning of catch basins will prevent flooding and erosion that would be costly to repair.

- Retain extant later features as long as they remain in good repair, serve a useful function and do not detract from the essential quality of the site.

- Eliminate safety hazards, including threats to people and site resources.

- Provide universal access within the constraints of the historic site.

- Avoid disturbance of archaeological features in sub-soils.

Next Steps

This Cultural Landscape Report provides background information on history, existing conditions, significance and recommendations for preservation treatment. However, it does not provide the details necessary for implementation. The next step is to prepare detailed construction drawings that must take into account not only the cultural landscape, but also park management and interpretive needs, and the findings of other recent reports regarding the site, such as the archeological investigation and the soil survey.

3. APPENDICES

A. BIBLIOGRAPHY

Note: Much of the historical information for this cultural landscape report came from extensive research files that the Content Design team with Public Archaeology Lab and CPS member Judy McDonough compiled for the Charlestown Preservation Society as part of the design and construction of three interpretive panels that explore the many themes associated with the Training Field and its history.

Historic Maps, Plans and Sketches (in chronological order)

1764 "Plan de la ville et du port de Boston: capitale de la Nouvelle Angleterre." Paris, Ches Lattre" http://groups.csail.mit.edu/mac/users/rauch/charlestown/maps/18th_Century.html (Figure 1.1)

1775 "View of the Attack on Bunker's Hill, with the Burning of Charlestown, June 17, 1775" http://groups.csail.mit.edu/mac/users/rauch/charlestown/postcards/all.html (Figure 1.2)

1775 "Plan of the heights of Charles Town, & c. R: W [Richard Williams]: Lieut.: R.W.F. Boston, Dec 13, 1775." Library of Congress, Maps of North America, 1750-1789, #922. (Figure 1.3)

1818 "Plan of Charlestown peninsula in the state of Massachusetts" by Peter Tufts. Library of Congress. http://memory.loc.gov/cgi-bin/map_item.pl (Figure 1.4)

1842 "*Boston with Charlestown and Roxbury*" by the Society for the Diffusion of Useful Knowledge (Great Britain). Boston Public Library, Norman B. Leventhal Map Center. (Figure 1.5)

1840s "The Old Training Field School House." Sketch from *An Account of the Second Re-union of the Graduates of the Training Field School in Charlestown held January 18, 1882* in Boston Public Library, Charlestown Branch.) (Figure 1.7)

1852 "Map of the City of Boston and immediate neighborhood" by Henry McIntyre. Boston Public Library, Norman B. Leventhal Map Center. (Figure 1.8)

1875 Hopkins. "Atlas of Boston." (Figure 1.12)

1913 Detail of "City of Boston, Public Grounds Department, Topographical Map of Winthrop Square." Prepared by Olmsted Brothers Landscape Architects. Boston Parks and Recreation Department files. (Figure 1.17)

1919 Detail of "City of Boston, Parks and Recreation Department, Grading, Loaming, Drainage and Concrete Work, Winthrop Square, Charlestown." Boston Parks and Recreation Department files. (Figure 1.18)

1954 "Planting, Walks and Benches at City Square, Charlestown." Boston Parks and Recreation Department files.

Period Plans (in chronological order)

1830s Period Plan 2: Civic Space. (Figure 1.6)

1860s Period Plan 3: Early Park Space. (Figure 1.11)

1890s Period Plan 4: War Memorial. (Figure 1.14)

1919 Period Plan 5: Public Park. (Figure 1.19)

1950s Period Plan 6: Outdoor Living Room. (Figure 1.24)

Note: "period plan" is a graphic format used to document the appearance of a landscape during a specific period or date. Using a standard graphic technique makes it easier to compare how properties have changed over time. The period plans in this report were drawn in 2013 specifically for this Cultural Landscape Plan. Most of the information for the period plans is derived from the historic maps and photographs used elsewhere in the report.

Photographs (in chronological order)

1860s View of Training Field from Bunker Hill Monument. Historic New England Archives. (Figure 1.9)

Ca. 1870 - Stereo image from showing the fountain at the Training Field. (Figure 1.10) Charlestown Branch Boston, Public Library.

1875 CIvil War monument stereo photograph with orange background. (Figure 1.13) *http://groups.csail.mit.edu/mac/users/rauch/charlestown/postcards/all.html*

1900 Revolutionary War plaques are at left, benches have been added in front of monument *http://groups.csail.mit.edu/mac/users/rauch/charlestown/postcards/all.html* (Figure 1.15)

Ca. 1900 Winthrop Square with Bunker Hill in the background. Card Cow.com. (Figure 1.16)

Mid 20th c: The following images are part of the Rev. Wolcott Cutler Collection (St. Johns Church Charlestown)

1925. View of Training Field. Boston Public Library, Flickr CHA-311-A2. (Figure 1.20)

1940 View of Training Field. Boston Public Library, Flickr CHA-311-A1. (Figure 1.23)

1944 View of Training Field. Boston Public Library, Flickr CHA-313-A1. (Figure 1.21)

1950 View of Training Field. Boston Public Library, Flickr CHA-311-B2. (Figure 1.22)

Books, Articles and Miscellaneous

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Boston Parks and Recreation Department – maps, annual reports

Boston Public Library, Charlestown Branch and Leventhal Map Collection – maps and photographs

Charlestown Preservation Society – particularly project files pertaining to interpretive panels

Massachusetts Historical Commission – inventory forms

B. COMPOSITE TRAINING FIELD PLANNINNG ELEMENTS

Note: this chart was prepared by Judy McDonough for the Charlestown Preservation Society in 2013.

Item	Description	Original Date	Location	Condition	Responsible Party	Dating Sources
Hardscape, Fencing, Furnishings, Pavement and Pathways, Public Art						
Fencing , Railings, & Bollards:	Tall iron picket fence, set on granite block basess, enclosing entire TF	Mid 20th c. fence, 1872 bases	Perimeter of site	poor	Boston Parks	BPL Cutler Collection/CPS analysis 2010; A Memorial History of the Revolutionary War Tablets, City Document #73 - 1889, BLC Ctown
	Paired granite entrance pillars, mostly relocated from original layout	1872, 1919	4 corners + mid Adams	joints deteriorated	Boston Parks	BPL Cutler Collection/CPS analysis 2010
	Pair granite entrance pillars	1872, 1919	Adams/Common	conserved 2011	Browne Fund	same as above
	Pair of iron decorative railings flanking steps ending on low granite spheres on square plinths	c. 1980	mid Adams	good	Browne Fund	PFD (Public Facilities Dept of CoB) Winthrop Details (partial plan now in BParks collection & 12/1983 Browne Fund application
	Iron reproduction bollards	c. 1980	both steps	missing & broken	Browne Fund	same as above
	Lower iron picket fence, with utility gates	c. 1938	perimeter of interior lawn	deteriorated	Boston Parks	Feb. 1938 BPD, Winthrop Sq.Drawing 6208B WPA Proposed: O.P. 665-14-2-229, Parks Commisssion Reports
Pathways & Steps:	circulation from corner entrances & mid-Adams	1872, 1914, SW entry in 1954	interior	serviceable	Boston Parks	Boston Parks, Drawing # 6209A, 5/12/1919; 5/31/1919, 6/26/1919, 7/18/1910, 9/4/1919,10/8/1919. 11/19/1919, 11/28/1919 Parks Commissioner Reports; Drawing 6206C of 1954
	broad concrete paths in Y pattern , with aprons for benches	c. 1919	interior	deteriorated at edges	Boston Parks	Boston Parks, Drawing # 6209A, 5/12/1919
	2 sets granite steps, NW corner revised with installation of Revoltionary War Tablets	1872, 1889	mid Adams & NW corner	poor mortar, inapropriate caulkng, ADA issues	Browne Fund	Various 1875+ Atlases show mid-Adams St. steps;
Curbing:	low granite curbing at path edge at embankment	c. 1919	along Adams	serviceable	Boston Parks	see relevant drawings above
	concrete draining stones along pathway edges	c.1919	main paths	deteriorated	Boston Parks	not documented
	concrete curb under interior picket fence	c. 1938		serviceable	Boston Parks	Feb. 1938 BPD, Winthrop Sq.Drawing 6208B WPA Proposed: O.P. 665-14-2-229, Parks Commisssion Reports

Item	Description	Original Date	Location	Condition	Responsible Party	Dating Sources
Furnishings:	16 reproduction benches set on concrete aprons	c. 1984-5; replace/repaired 2011	along pathways	good	Browne Fund	PFD (Public Facilities Dept of CoB) Winthrop Details (partial plan now in BParks collection & 12/1983 Browne Fund application
	one metal water fountain with hose spigot	c. 1980	E. path	deteriorated	Boston Parks	same as above
	5 reproduction, electric acorn light standards, retrofitted with downlights	late 20th c.	various	good	????	unknown
	XX inground electic conduit boxes	late 20th c.	near NW corner	????	????	unknown
	3 Interpretive Panels set on concrete paths	Nov-10	NW, NE, & SE corners	new	Browne Fund	Browne Fund Grant to CPS
	solarpowered green trash containers	late 20th c.	NW & S paths	deteriorated	Boston Parks	visual
	Signage consisting of:				Boston Parks	
	1 Standard Boston Parks Identification Sign	late 20th c	interior light post	good	Boston Parks	Boston Parks
	XX Standard Boston Parks Regulatory Signs	late 20th c	various	good	Boston Parks	Boston Parks
	XX Standard Boston Parks Regulatory Dog Signs	late 20th c	ext. perimeter fence	good	Boston Parks	Boston Parks
	2 bronze Edward Ingersoll Browne Fund Signs	late 20th c	ext. perimeter fence	good	Boston Parks	Browne Fund
Utilities:	electrical	unknown	unknown	unknown	unknown	unknown
	water	unknown	unknown	unknown	unknown	unknown
	gas	unknown	unknown	unknown	unknown	unknown
	sewer	unknown	unknown	unknown	unknown	unknown
Public Art:	Granite Soldiers and Sailors Monument	1871/72	interior lawn	excellent	Browne Fund	Henderson Fund Grant to CPS; private donations; Browne Fund grant to CPS with Interpretive Panels
	4 Revolutionary War Bronze Tablets re-mounted on pair of large granite plinths	1889,19xx	NW entry	excellent	Browne Fund	A Memorial History of the Revolutionary War Tablets, City Document #73 - 1889, BLC Ctown; Browne Fund records
Trees, shrubs, grass						
	Note: 2014 Training Field Cultural Resource Plan updates these tree and shrub types and numbers accurately					
Trees:	8 Linden Trees	1919 & 1950s	interior lawn	anthracnose infected, pruned 2012	Boston Parks	Boston Parks, Drawing # XX, BPL Cutler Collection- CPS photo analysis 2010
	13 Maple & other Tree	later 20th c.		pruned 2012	Boston Parks	same as above
	1 Comemorative Evergreen set on S side	1990s	S side lown	good	Boston Parks	Charlestown Patriot:Dennis McLaughlin Family
	2 decorative flowering trees	c. 1980	NW corner steps	need pruning	Boston Parks	likely Browne Fund
Shrubs:	2 yew shrubs	c. 1980	NW corner steps	pruned 2012?	Boston Parks	same as above

Item	Description	Original Date	Location	Condition	Responsible Party	Dating Sources
Lawns:	Interior lawn with 2 decorative circular planting beds	c. 1919	within interior fence	serviceable	Boston Parks	Boston Parks, Drawing # XX, BPL Cutler Collection- CPS photo analysis 2010
	3 "lawn" areas sloping southerly	c. 1919	Winthrop & both Common Sts.	compacted soil, mature shade trees, major soil runoff	Boston Parks	Boston Parks, Drawing # XX BPL Cutler Collection - CPS analysis 2010
	1 banked area	c. 1919	N - Adams	compacted soil, mature shade trees, major soil runoff	Boston Parks	Boston Parks, Drawing # XX BPL Cutler Collection - CPS analysis 2010

C . DRAFT TRAINING FIELD ARCHAEOLOGY REPORT BY CITY ARCHAEOLOGIST JOE BAGLEY 1-15-2014

Note: this a draft report prepared by City Archaeologist Joe Bagley in January 2014. For updates on Training Field archaeology see the City Archeologist's Facebook page and website:

www.facebook.com/bostonarchaeologyprogram and www.cityofboston.gov/archaeology

At the urging of the Charlestown Preservation Society and with the full cooperation of the Boston Parks and Recreation Department, the City of Boston Archaeology program was brought into the planning stage of the restoration and landscape improvement master plan for Charlestown's historic Training Field (Winthrop Square) Park. The results of this survey are indicative of the great potential parks in Boston have for yet-undocumented significant archaeological sites.

The Park has been an active participant in Charlestown's history since the 17th century functioning over nearly 300 years as a cow pasture, militia training field, school house, open gathering space, and a place of memorial. Despite its location directly between the Bunker Hill memorial and City Square, both locations of numerous and extensive archaeological surveys conducted over the past 30 years, the Training Field had never undergone professional archaeological survey.

Beside its use in wars, the most precisely dated use of the Park is the construction and later removal of a schoolhouse on the Parks western corner. This schoolhouse was built on the Park in 1828 and moved to a new location across the street in 1848, apparently to return the Park to a more Park-like appearance.

Because of its well documented history coupled with the fact that the majority of the Park had never been developed during its history, the Park possess high archaeological sensitivity, which means the Park has had significant historical activities associated or potentially associated with it, and the overall preservation potential of the Park is such that material culture left behind by these activities is likely to still be present approximately where it was originally left behind. This high sensitivity made archaeological survey both reasonable and likely to produce significant historical data that can contribute to a better understanding and appreciation of this important piece of Charlestown.

The archaeological survey was conducted over a period of three consecutive weeks in September by a team of volunteers from the City Archaeology Program and the local community members of Charlestown. This was the first City-run dig to actively seek and use local volunteers without prior field experience, and given its success, we will continue to implement such measures in the future.

In total, 48 shovel test pits were excavated. These small units measured 50x50 cm in size (20x20 inches) and were dug to a depth of 120 cm (4 feet) or until the digging was impeded by immovable objects. This dig was supported by a donated Ground Penetrating Radar (GPR) survey conducted by Geophysical Survey Systems, Inc. The test pits were placed on a 10-meter grid across the site to ensure maximum coverage of the entire Park. Bracketing test pits placed at 5 meter intervals were dug around each pit with significant deposits to determine size and significance of archaeological deposits.

While exact artifact counts are still pending complete cataloging of the recovered materials (ongoing as of writing), estimated artifact recovery is between 5,000 and 10,000 artifacts.

Despite ongoing research, preliminary results can be presented here. These results may be refined or expanded based on the analysis that will be completed shortly. Planning can take into account this summary report, but exact determinations on the need for future archaeology should be made only on the results presented in the final report.

Overall, a deep fill deposit was encountered across the entire Park. This deposit appears to consist mostly of deep sub-soils excavated from somewhere outside of the Park and deposited onto the Park. Possible origins of these soils are nearby foundation excavations, landscape improvements and modifications on nearby Bunker Hill, or some other local origin. Based on the artifacts in this deposit, these deposits appear to date to sometime after the removal of the Schoolhouse from the Park and may have been deposited as a means to restore the landscape back to Parkland after the school was removed and its foundation filled in. These fill deposits range in depth across the site. Some amount of top soils containing artifacts were mixed into these fill soils resulting in artifacts from a broad date range appearing mixed together in this fill throughout the site.

Two areas of Native American occupation, dating to the period prior to the arrival of Europeans to Charlestown in 1629 were found on the Training Field. One area was located on the eastern corner of the Park near the entrance at the corner of Adams and Common Streets. A second area of Native occupant was the northern end of the Park between the two Norway Maples and site of the most significant erosion on the Park.

From later periods, what is presumed to be the former circular fountain was encountered in the center of the park, though larger holes were not permitted in this phase of excavations to conclusively identify the concrete feature found below ground. It is assumed, based on historic maps, that the concrete was related to the fountain.

Also from later periods was a late 18th and early 19th century trash deposit found 120 cm (4 feet) below ground. This deposit was encountered in several test pits in the northern corner of the Park near the entrance at the corner of Winthrop and Adams Streets. Due to restrictions on depth for this phase of survey, we could not get through the entirety of the deposit to determine its origin or depth. A square-shaped brick feature encountered near the former location of the Schoolhouse appears to be some sort of foundation support for either a porch or some other structure associated with the school. Somewhat ironically, no Revolutionary era military artifacts were found in intact deposits anywhere in the park.

At present, the entirety of the collection has been washed and sorted. Cataloging is ongoing. Once cataloged, I will be analyzing the assemblage to determine what has been found and its historical significance, I will precisely delineate areas of significance and include depth of upper fill deposits of no significance for these areas, and I will be making recommendations for future archaeology in these areas if disturbance cannot be avoided. Preliminary results indicate that there are four areas of significance within the park that warrant additional archaeological survey if master plan implementation involves disturbance of these resources. I also recommend two areas of potential public interpretation that do not warrant additional testing.

The four significant areas are the two native sites, the late 18th-early 19th century trash deposit, and a brick feature likely associated with the schoolhouse. The potential public

interpretation locations are the area of the former fountain and the actual schoolhouse foundation, which may have been found via GPR, but was not encountered during digging, likely due to the small size of our units not being able to find a relatively precise deposit such as a thin foundation wall. Additional areas of significance may be added as a result of the pending analysis of the assemblage recovered during the dig.

Due to the presence of extensive fill throughout the park and the extensive testing conducted during this survey, *I do not recommend any additional testing within the upper fill deposit.* This is stated with one reservation: If below-ground disturbance within the upper fill prevents access to deposits located below this fill (such as paving, installation of cisterns, and other immovable construction), I recommend that excavations be conducted within significant areas below the fill where these deposits will be covered.

I recommend that the Parks department work to avoid below-ground disturbance. If below-ground disturbance cannot be avoided, additional testing may be required to remove significant archaeological deposits prior to construction. All excavations will be done quickly to avoid delay to the overall project due to archaeological excavations.

If excavations are required as a result of discussions between the Parks department and the City Archaeologist, I will not require the testing of the upper fill, which has been conclusively determined to be highly disturbed. This deposit will be removed entirely without screening to efficiently reach intact lower deposits that actually contain significant historic resources. This will ensure that the length of future digs will be minimized. Testing will only be done in locations that will be directly impacted by below-ground work in accordance with the master plan for the Training Field Park.

D. MASONRY CLEANING RECOMMENDATIONS

Ivan Myjer
Building and Monument Conservation
83 School Street
Arlington, MA 02476
781 641-1603

September 3, 2013

Charlestown Preservation Society
PO Box 290201
Charlestown, Ma 02129
Attn: Ms. Judy McDonough

Re: Winthrop Square Park - Masonry Assessment Report and Budgets

Dear Judy,

In June of 2011 Building and Monument Conservation completed an assessment of the stone features in the park and produced a report dated June 11, 2013. The features were re-examined this August to produce this updated report. As part of the assessment the condition of the Soldier's Monument, which was restored in 2009, was reviewed as well as the three entries to the park on the north and the two on the south. Brief descriptions of the conditions of each the features are provided below along with budgets for the recommended treatments. A specification for cleaning and repointing of the granite is also provided.

There are a number of general conditions that apply to most of the features in the park. All of the granite features appear to Hallowell, Maine except possibly for the granite bases at the piers and the granite bases as the perimeter fence. Some of these elements were coated with paint to conceal graffiti and, when the paint was removed, a clear coating was applied. The clear coating as well as the remnants of the paint are obscuring the true color of the granite. It is possible that the bases are one of the lighter shades of Quincy Granite rather than Hallowell granite.
Many of the granite units have suffered from the impact of vehicles driven into the park. The impact from the machinery has spalled the edges of the granite but not otherwise affected the stability of the units. It is not possible to say when these spalls occurred. Since these types of impact losses in granite are difficult and costly to repair, steps should be put into place to prevent these types of collisions.

Sincerely,

Ivan Myjer
Principal
Building and Monument Conservation

Soldier's Monument
Conditions:

1. The work completed in 2009 is holding up well. Slight staining from biological growths can be observed on the horizontal surfaces and on the vertical surfaces directly below overhanging ledges.
2. Eleven large and small areas of spalling that were not addressed in 2009 remain. These areas are primarily an aesthetic concern and do not affect the stability of the monument.

Recommendations:

1. Rinse the monument from the ground with medium pressure water and then apply Prosoco Biowash diluted 1:10 with water using long handled brushes. Rinse the monument again with medium pressure.
2. Repair the five larger spalls at the north elevation base and steps using granite dutchmen obtained from the historic quarry.

Granite piers with bronze tablets at the northwest entry to park:
Conditions:

1. Bronze plaques were treated recently and are in good condition.
2. Granite units are in good condition but the mortar joints are open and failing.
3. There are various types of stains and minor discolorations caused by weathering of the granite but none of them are out of character or inconsistent with the age of the stone.

Recommendations:

1. Protect the bronze plaques with plastic tarps to prevent damage while other work is taking place.
2. Cut and repoint mortar joints as per attached specifications.
3. Clean granite using only Prosoco Biowash diluted 1:10 with water. More aggressive chemicals may leak behind the plastic and damage the bronze.

West Entry Stairs at Tablets and Freedom Trail Bricks
Conditions:

1. The stairs have shifted slightly forward due to water infiltration thru failed sealant and mortar joints.
2. The red bricks that form the Freedom Trail are damaged from freeze-thaw at both approaches to the steps.
3. Granite is stained from general use.

Recommendations:

1. Replace frost damaged bricks using matching bricks.
2. We do not recommend removing and resetting the granite steps at this time.
3. Remove failed sealant and mortar and install new mortar.
4. Clean granite to remove staining.

Center Entry Stairs and Granite Piers (mid-Adams St.)

Conditions:

1. The stairs have shifted slightly forward due to water infiltration thru failed sealant and mortar joints.
2. Granite at steps and side walls is stained from general use.
3. Finials are missing from top of granite piers. Finals were reportedly removed by Boston Parks and Recreation and may be in storage.
4. Small losses at edges of granite piers from impact with vehicles.
5. Clear coating was applied to round granite bollards at step walls.
6. Cast iron bollards at entry are damaged or missing.
7. Heavy rust staining where iron fence is attached to piers.

Recommendations:

1. We do not recommend removing and resetting the granite steps at this time.
2. Remove failed sealant and mortar and install new mortar at steps.
3. Clean granite to remove staining.
4. Install original finials at piers. Finials may require the removal of ferrous pins as well as the repair of cracks caused by the expansion of corroding ferrous pins.
5. We do not recommend repairing shallow losses in the granite piers.
6. It is not possible to remove the iron rust staining until the fence is removed and repainted because the stains will reoccur.

North East Entry Granite Piers (at Adams and Common Sts.)

Conditions:

The pier closest to the Civil War Monument was struck by a vehicle early in 2013. The pier was toppled and the repairs that were completed in June 2011 were destroyed. The pier was reset in early Spring and appears to be stabile.

1. Edge losses from impact with vehicles.
2. Slight misalignment where stone was repaired in 2013
3. Heavy rust staining where iron fence is attached to piers.
4. Old iron inserts at sides of pier are corroding and will eventually crack the granite.
5. Finial is missing.

Recommendations

1. It is not possible to remove the iron rust staining until the fence is removed and repainted because the stains will reoccur.

South Entry Granite Piers (at Common and Park Streets)

Conditions:

1. Urns and finials are missing from top of granite piers. Finals and possibly runs were reportedly removed by Boston Parks and Recreation and may be in storage.
2. Edge losses from impact with vehicles.
6. Open and failed mortar joints.
7. Two prior dutchman repairs and a repair with cement and broken granite. Dutchmen repairs were not installed by skilled stone craftsmen and do not align with adjacent surfaces and moldings.

8. Blue/gray paint is covering the base of the west pier.
9. Iron inserts in granite are corroding and will eventually crack the granite.

Recommendations

1. Install original urns and finials at piers. Installation may require the removal of ferrous pins as well as the repair of cracks caused by the expansion of corroding ferrous pins.
2. Remove paint at base of west pier.
3. Remove prior dutchmen and cement repairs at losses and redo using matching Hallowell granite.
4. It is not possible to remove the iron rust staining until the fence is removed and repainted because the stains will reoccur.

Granite bases at perimeter fencing

Conditions:

1. The granite bases (from the original decorative iron fence of 1872 (see Cutler images at Charlestown Public Library, Cutler Collection) appear to have been painted black.
2. Some of the bases have been chipped at the edges.

Recommendations:

1. We do not recommend cleaning or treating the granite bases until the iron fence can be removed for painting as the rusting iron will stain the stone.

E. SOIL HEALTH ASSESSMENT REPORT BY DR. CHARLES D. SHERZI, JR.

The Winthrop Square
Charlestown, Massachusetts
Soil Health Assessment Report

Using the Cornell Soil Health Assessment protocol to assess the level of soil health at Winthrop Square 'Training Field' Charlestown, Massachusetts

9-September-2013

Charles D. Sherzi, Jr.
Charles D. Sherzi, Jr. & Associates
One Cottage Road
Andover, MA 01810
Ph: 978-888-1879

The Winthrop Square 'Training Field' Site Soil Health Assessment Report

Scope

The following is a comprehensive diagnostic report based on a series of recent soil health assessments which is being submitted to Margaret Dyson, Director of the Historic Parks in the City of Boston. The report is an overall soil health assessment of Winthrop Square "Training Field" detailing the condition of the site at the soil level.

The report includes the soil health assessment data analysis from Cornell, interpretation of that data, site observations taken during sampling, and a full detailed plan including soil remediation recommendations detailing the appropriate tools, products, and materials.

The Winthrop Square "Training Field" site is an historic park sitting on .89 acres in Charlestown, Massachusetts. This urban park is enjoyed by local residents and by the many tourists who journey each year to the City of Boston and walk the Freedom Trail.

The Site is naturally divided into six unique areas through the use of walkways and fencing. These areas are of various size containing both turf and trees. Each area has its own set of circumstances such as heavy foot traffic to no foot traffic, different grade elevations, signs of erosion, bare soil vs turf covered ground, etc. Accordingly, six different assessments were done – one assessment for each area at the site.

General Comments on Assessment Results:

The site scored below average in four of the six areas sampled. Two of the areas receiving an overall quality score of **medium** with the remaining four areas receiving a **low** quality score.

The **aggregate stability** and **available water capacity** ratings scored **high** on each of the six assessments submitted for analysis. This appears to be the result of minimal soil disturbance (digging & construction) at the site over the years. Having good stable aggregates are like money in the bank and gives you plenty to work with when developing your remediation plan.

The **surface hardness** and **subsurface hardness** ratings (the measurement of soil compaction) scored significantly **low** and **medium** throughout the site. The **surface hardness** rating measures penetration resistance at the 0 – 6 inch depth. The **subsurface hardness** rating measures penetration resistance at the 6 – 18 inch depth.

The biological indicators scored mostly in the **medium** and **low** ranges and reflect marginalized soil microbial activity at the site. Although several areas tested within range for **organic matter** – it is the reduced amount of **active carbon,** or, the fresher organic residues present that help feed the microbes, which is reduced. The impacted microbial activity slows the conversion (mineralization) of N and other elements from organic to plant available form. Keep in mind that **active carbon** is a "leading indicator" regarding the soil health response to changes in soil management and responds much sooner than total organic matter content. The **medium root health** score received on five of the six assessments are the result of increasing anaerobic conditions and pathogen counts caused by the soil compaction levels at the site.

Among the chemistry indicators **soil pH** and **minor elements** scored **low** and **medium** in five of the six areas sampled. This appears to the result of three conditions:

- The soil textural classification on all six assessments is a sandy loam. Sandy loams typically have lower cation exchange capacities and in turn have trouble retaining nutrients which are usually lost through leaching in the profile.

- Runoff and erosion due to surface hardness throughout the site.

- Limited microbial activity which is slowing the conversion (mineralization) of organic residues into plant available forms.

Lastly, given the location of this urban site, I also tested for heavy metals. The amount of heavy metals in all areas sampled was found to be below the maximum allowable concentrations for garden soil. The lower heavy metal concentrations at the site is not only a big plus for plant health and the environment but also makes for safer working conditions for those involved with any soil remediation efforts and seasonal horticultural activity at the site.

Cornell Soil Health Assessment – Key to Reading the Report

- The top section provides the background information about where the soil sample came from, contact information, and other basic information about the site.
- The middle section provides the indicators that were measured and are color coded to separate the physical (blue), biological (green), and chemical (yellow) indicators.
    - The value scores range from 0 to 100, worst to best respectively, for the individual indicators.
    - The rating presents the soil quality scores and color coding.
        - >30 low/poor quality - red
        - 30-70 medium quality – yellow
        - <70 high quality – green
- Constraints are indicated when the soil is of poor quality and indicate possible options for addressing the quality of the soil.
- Overall quality score is computed using the indicators and given an overall rating.
    - >40% - very low
    - 40%-55% - low
    - 55%-70% - medium
    - 70%-85% - high
    - <85% - very high

INITIAL SITE VISIT – June 04, 2013

Winthrop Square - June 4th, 2013 Initial Site Observation Comments:

- During my initial meeting with Margaret and visual inspection of the site, I found it to be neat and clean in appearance. The site is located just below the Bunker Hill Monument, is topographically a gradual slope, and is located in full sun.
- The size of the site is .89 acres approximately half of which is under hardscape.
- The existing tree collection throughout looked to be in good general health with all trees in full leaf and most trees exhibiting a proper root flare. Some trees however did exhibit girdling and encircling roots and some had been removed.
- The existing turf overall has a patchy consistency throughout. The exception being **Area #3** which had a full dense turf cover.
- Many areas exhibited signs of soil erosion and exposed soil roots.

Cornell Soil Health Assessment – Area #1

CORNELL SOIL HEALTH TEST REPORT			
Name of Farmer: Chuck Sherzi, Jr.			Sample ID: k1056
Location: One Cottage Rd., Andover, MA, 01810			Agent: 0
Field/Treatment: Sample-Area #1 Winthrop Square, Charlestown			Agent's Email: 0
Tillage: 0			Given Soil Texture: 0
Crops Grown: 0			Date Sampled: 6/20/2013
	Indicators	Value	Rating	Constraint
PHYSICAL	Aggregate Stability (%)	65.9	95	
	Available Water Capacity (m/m)	0.25	96	
	Surface Hardness (psi)	475	0	rooting, water transmission
	Subsurface Hardness (psi)	518	2	Subsurface Pan/Deep Compaction
BIOLOGICAL	Organic Matter (%)	3.8	67	
	Active Carbon (ppm) [Permanganate Oxidizable]	482	38	
	Potentially Mineralizable Nitrogen (µgN/ gdwsoil/week)	4.4	1	N Supply Capacity
	Root Health Rating (1-9)	3.3	75	
CHEMICAL	pH (see Nutrient Analysis Report)	6.3	100	
	Extractable Phosphorus (see Nutrient Analysis Report)	17.2	100	
	Extractable Potassium (see Nutrient Analysis Report)	79.6	100	
	Minor Elements (see Nutrient Analysis Report)		100	
OVERALL QUALITY SCORE (OUT OF 100):			64.4	Medium
Soil Textural Class:==> sandy loam				
SAND (%): 56.6		*SILT (%): 35.9*		*CLAY (%): 7.5*

Analysis of Soil Health Assessment – Area #1

- The **Area #1** results exhibited high scores for the **aggregate stability** and **available water capacity** indicators. However, the **surface hardness** and **subsurface hardness** indicators scored **low**. Compaction at these levels usually impacts several of the biological indicators.
- The biological indicators in this area as a whole did not fare well. The percent of **organic matter** scored **medium** and the indicators for **active carbon** and **mineralizable N** scored **medium** and **low** respectively. The heavy soil compaction present in this area is creating a growing anaerobic environment in the soil which in turn is impacting the microbial communities and the entire soil food web. Unless the compaction is addressed in some manner these conditions will continue to degrade and the health of the plant material at the site will start to decline.
- There is an anomaly in this area in that the soil surface and subsurface hardness scored very low, but appears not to be impacting the root health rating which is high. This situation does not show up in any of the other areas.
- Lastly, all of the soil chemistry indicators scored high across the board. This is usually the case as the chemical components of soil have historically been the sole focus of university extension soil testing models and modern fertilizer recommendation/application practices.

Cornell Soil Health Assessment – Area #2

CORNELL SOIL HEALTH TEST REPORT			
Name of Farmer: Chuck Sherzi, Jr.			Sample ID: k1057
Location: One Cottage Rd., Andover, MA, 01811			Agent: 0
Field/Treatment: Sample-Area #2 Winthrop Square, Charlestown			Agent's Email: 0
Tillage: 0			Given Soil Texture: 0
Crops Grown: 0			Date Sampled: 6/20/2013
	Indicators	Value	Rating	Constraint
PHYSICAL	Aggregate Stability (%)	48.0	75	
	Available Water Capacity (m/m)	0.20	83	
	Surface Hardness (psi)	362	1	rooting, water transmission
	Subsurface Hardness (psi)	475	5	Subsurface Pan/Deep Compaction
BIOLOGICAL	Organic Matter (%)	3.8	67	
	Active Carbon (ppm) [Permanganate Oxidizable]	504	41	
	Potentially Mineralizable Nitrogen (µgN/ gdwsoil/week)	6.5	8	N Supply Capacity
	Root Health Rating (1-9)	6.3	38	
CHEMICAL	pH (see Nutrient Analysis Report)	5.1	0	Toxicity, Nutrient Availability (for crop specific guide, see CNAL report)
	Extractable Phosphorus (see Nutrient Analysis Report)	20.6	100	
	Extractable Potassium (see Nutrient Analysis Report)	82.1	100	
	Minor Elements (see Nutrient Analysis Report)		11	More than one minor- or/and micro-nutrient deficiencient or excessive
OVERALL QUALITY SCORE (OUT OF 100):			44.1	Low
Soil Textural Class:==> sandy loam				
SAND (%): 60.3		*SILT (%): 32.3*		*CLAY (%): 7.5*

Analysis of Soil Health Assessment – Area #2

- The **Area #2** results again exhibited high scores for the **aggregate stability** and **available water capacity** indicators. While the **surface hardness** and **subsurface hardness** indicators scored a little better than areas #1, they are still **low**. Compaction at these levels usually impacts several or all of the biological indicators.
- The biological indicators in this area assessment are in a complete downturn. The percent of **organic matter** again scored **medium** and the indicators for **active carbon** and **mineralizable N** scored a little better but still scored **medium** and **low** respectively. The heavy soil compaction present in this area is creating a growing anaerobic environment in the soil which in turn is impacting the microbial communities and the entire soil food web as whole. Unless the compaction is addressed in some manner these conditions will continue to degrade and the health of the plant material at the site will start to decline. The **root health rating** also scored **medium** in the assessment giving further evidence that the soil food web in this area is more degraded than **Area #1.**
- The soil chemistry indicators in this area are exhibiting problems not seen in Area #1. The resulting **low** scores for both **pH** and **Minor Elements** appear to be the result of a combination of factors including the soil texture – sandy loam, nutrient leaching, and erosion due to sparse vegetation and topography.
- In addition, the loss of nutrient base cations such as Mg++ and Ca++ from the soil profile causes a drop in soil pH which acts as a gauge for the availability of the many minor or micro elements present in the soil.

Cornell Soil Health Assessment – Area #3

CORNELL SOIL HEALTH TEST REPORT			
Name of Farmer: Chuck Sherzi, Jr.			Sample ID: k1058
Location: One Cottage Rd., Andover, MA, 01812			Agent: 0
Field/Treatment: Sample-Area #3 Winthrop Square, Charlestown			Agent's Email: 0
Tillage: 0			Given Soil Texture: 0
Crops Grown: 0			Date Sampled: 6/20/2013
	Indicators	Value	Rating	Constraint
PHYSICAL	Aggregate Stability (%)	79.5	99	
	Available Water Capacity (in/in)	0.19	79	
	Surface Hardness (psi)	258	16	rooting, water transmission
	Subsurface Hardness (psi)	275	67	
BIOLOGICAL	Organic Matter (%)	4.8	86	
	Active Carbon (ppm) [Permanganate Oxidizable]	445	32	
	Potentially Mineralizable Nitrogen (µgN/ gdwsoil/week)	8.2	29	N Supply Capacity
	Root Health Rating (1-9)	5.0	50	
CHEMICAL	pH (see Nutrient Analysis Report)	4.7	0	Toxicity, Nutrient Availability (for crop specific guide, see CNAL report)
	Extractable Phosphorus (see Nutrient Analysis Report)	13.2	100	
	Extractable Potassium (see Nutrient Analysis Report)	92.9	100	
	Minor Elements (see Nutrient Analysis Report)		56	
OVERALL QUALITY SCORE (OUT OF 100):			59.5	Medium
Soil Textural Class:==> sandy loam				
SAND (%): 57.4		*SILT (%): 35.6*		*CLAY (%): 7.0*

Analysis of Soil Health Assessment – Area #3

- The **Area #3** results exhibited the highest scores for the **aggregate stability** and **available water capacity** indicators. The **surface hardness** and **subsurface hardness** indicators scored the best of all the assessments at **low** and **medium** respectively.
- The biological indicators in this area assessment scored the best of all the six (6) assessments. The **high** score of **organic matter** aside and the remaining indicators for **active carbon** and **mineralizable N** improved to **medium** and **low**. The soil compaction present in this area is still creating a growing anaerobic environment in the soil which in turn is impacting the microbial communities. Unless the compaction is addressed in some manner these conditions will continue to degrade and the health of the plant material at the site will start to decline. The **root health rating** also scored **medium**.
- The soil chemistry indicators in this area are exhibiting similar problems as in Area #2 although a little better. The resulting **low** and **medium** scores for both **pH** and **Minor Elements** appear to be the result of a combination of factors including the soil texture – sandy loam, and nutrient leaching.
- In addition, the loss of nutrient base cations such as Mg++ and Ca++ from the soil profile causes a drop in soil **pH** which acts as a gauge for the availability of the many minor or micro elements present in the soil.

Cornell Soil Health Assessment – Area #4

CORNELL SOIL HEALTH TEST REPORT			
Name of Farmer: Chuck Sherzi, Jr.			Sample ID: k1059
Location: One Cottage Rd., Andover, MA, 01813			Agent: 0
Field/Treatment: Sample-Area #4 Winthrop Square, Charlestown			Agent's Email: 0
Tillage: 0			Given Soil Texture: 0
Crops Grown: 0			Date Sampled: 6/20/2013
	Indicators	Value	Rating	Constraint
PHYSICAL	Aggregate Stability (%)	66.9	95	
PHYSICAL	Available Water Capacity (in/in)	0.19	82	
PHYSICAL	Surface Hardness (psi)	295	8	rooting, water transmission
PHYSICAL	Subsurface Hardness (psi)	337	41	
BIOLOGICAL	Organic Matter (%)	4.2	75	
BIOLOGICAL	Active Carbon (ppm) [Permanganate Oxidizable]	382	23	Soil Biological Activity
BIOLOGICAL	Potentially Mineralizable Nitrogen (µgN/ gdwsoil/week)	4.7	1	N Supply Capacity
BIOLOGICAL	Root Health Rating (1-9)	5.7	50	
CHEMICAL	pH (see Nutrient Analysis Report)	5.3	0	Toxicity, Nutrient Availability (for crop specific guide, see CNAL report)
CHEMICAL	Extractable Phosphorus (see Nutrient Analysis Report)	19.7	100	
CHEMICAL	Extractable Potassium (see Nutrient Analysis Report)	80.3	100	
CHEMICAL	Minor Elements (see Nutrient Analysis Report)		11	More than one minor- or/and micro-nutrient deficiencient or excessive
OVERALL QUALITY SCORE (OUT OF 100):			48.9	Low
Soil Textural Class:==> sandy loam				
SAND (%): 59.9		*SILT (%): 31.9*		*CLAY (%): 8.2*

Analysis of Soil Health Assessment – Area #4

- The **Area #4** results again scored **high** for the **aggregate stability** and **available water capacity** indicators. However, the **surface hardness** and **subsurface hardness** indicators scored **low** and **medium** respectively. Compaction at these levels usually impacts several or all of the following biological indicators.
- The biological indicators in this area presented a mixed bag in terms of results. The percent of **organic matter** again scored **high** - second highest of all the assessments. However, the indicators for **active carbon** and **mineralizable N** both scored **low** and were the lowest of all the assessments. The heavy soil compaction present in this area is creating a growing anaerobic environment in the soil which in turn is impacting the microbial communities and the entire soil food web. Unless the compaction is addressed in some manner these conditions will continue to degrade and the health of the plant material at the site will start to decline. The **root health rating** also scored **medium** in the assessment giving further evidence that the soil food web in this area is in decline**.**
- The soil chemistry indicators in this area are exhibiting **low** scores for both **pH** and **Minor Elements** which appear to be the result of a combination of factors including the soil texture – sandy loam, nutrient leaching, and erosion due to sparse vegetation and topography. This area exhibited the worst erosion of all the areas.
- In addition, the loss of nutrient base cations such as Mg++ and Ca++ from the soil profile causes a drop in soil pH which acts as a gauge for the availability of the many minor or micro elements present in the soil.

Cornell Soil Health Assessment – Area #5

CORNELL SOIL HEALTH TEST REPORT				
Name of Farmer: Chuck Sherzi, Jr.			Sample ID: k1060	
Location: One Cottage Rd., Andover, MA, 01814			Agent: 0	
Field/Treatment: Sample-Area #5 Winthrop Square, Charlestown			Agent's Email: 0	
Tillage: 0			Given Soil Texture: 0	
Crops Grown: 0			Date Sampled: 6/20/2013	
	Indicators	Value	Rating	Constraint
PHYSICAL	Aggregate Stability (%)	70.9	97	
	Available Water Capacity (m/m)	0.21	88	
	Surface Hardness (psi)	452	0	rooting, water transmission
	Subsurface Hardness (psi)	505	2	Subsurface Pan/Deep Compaction
BIOLOGICAL	Organic Matter (%)	4.1	73	
	Active Carbon (ppm) [Permanganate Oxidizable]	456	33	
	Potentially Mineralizable Nitrogen (µgN/ gdwsoil/week)	1.0	0	N Supply Capacity
	Root Health Rating (1-9)	5.0	50	
CHEMICAL	pH (see Nutrient Analysis Report)	4.7	0	Toxicity, Nutrient Availability (for crop specific guide, see CNAL report)
	Extractable Phosphorus (see Nutrient Analysis Report)	18.4	100	
	Extractable Potassium (see Nutrient Analysis Report)	62.1	72	
	Minor Elements (see Nutrient Analysis Report)		11	More than one minor- or/and micro-nutrient deficiencient or excessive
OVERALL QUALITY SCORE (OUT OF 100):			43.9	Low
Soil Textural Class:==> sandy loam				
SAND (%): 60.3		*SILT (%): 31.9*		*CLAY (%): 7.8*

Analysis of Soil Health Assessment – Area #5

- The **Area #5** results again scored **high** for the **aggregate stability** and **available water capacity** indicators. However, both the **surface hardness** and **subsurface hardness** indicators scored **low**. Compaction at these levels usually impacts several or all of the following biological indicators. **Area #5** is the second largest in square footage of all the areas assessed.
- The biological indicators in this area assessment are similar to Area # 4 with the percent of **organic matter** again scoring **high** – third highest of all the assessments. However, the indicators for **active carbon** and **mineralizable N** scored **medium** and **low** and were the lowest of all the assessments. The heavy soil compaction present in this area is creating a growing anaerobic environment in the soil which in turn is impacting the microbial communities and the entire soil food web. Unless the compaction is addressed in some manner these conditions will continue to degrade and the health of the plant material at the site will start to decline. The **root health rating** also scored **medium** in the assessment giving further evidence that the soil food web in this area is in decline**.**
- The soil chemistry indicators in this area are exhibiting **low** scores for both **pH** and **Minor Elements** which appear to be the result of a combination of factors including the soil texture – sandy loam, nutrient leaching, and erosion due to sparse vegetation and topography.
- In addition, the loss of nutrient base cations such as Mg++ and Ca++ from the soil profile causes a drop in soil pH which acts as a gauge for the availability of the many minor or micro elements present in the soil.

Cornell Soil Health Assessment – Area #6

CORNELL SOIL HEALTH TEST REPORT			
Name of Farmer: Chuck Sherzi, Jr.			Sample ID: k1061
Location: One Cottage Rd., Andover, MA, 01815			Agent: 0
Field/Treatment: Sample-Area #6 Winthrop Square, Charlestown			Agent's Email: 0
Tillage: 0			Given Soil Texture: 0
Crops Grown: 0			Date Sampled: 6/20/2013
	Indicators	Value	Rating	Constraint
PHYSICAL	Aggregate Stability (%)	59.2	90	
	Available Water Capacity (m/m)	0.21	87	
	Surface Hardness (psi)	420	0	rooting, water transmission
	Subsurface Hardness (psi)	510	2	Subsurface Pan/Deep Compaction
BIOLOGICAL	Organic Matter (%)	3.9	71	
	Active Carbon (ppm) [Permanganate Oxidizable]	238	9	Soil Biological Activity
	Potentially Mineralizable Nitrogen (µgN/ gdwsoil/week)	11.7	87	
	Root Health Rating (1-9)	5.3	50	
CHEMICAL	pH (see Nutrient Analysis Report)	4.6	0	Toxicity, Nutrient Availability (for crop specific guide, see CNAL report)
	Extractable Phosphorus (see Nutrient Analysis Report)	21.3	100	
	Extractable Potassium (see Nutrient Analysis Report)	77.7	100	
	Minor Elements (see Nutrient Analysis Report)		11	More than one minor- or/and micro-nutrient deficiencient or excessive
OVERALL QUALITY SCORE (OUT OF 100):			50.5	Low
Soil Textural Class:==> sandy loam				
SAND (%): 59.3		*SILT (%): 31.9*		*CLAY (%): 8.8*

Analysis of Soil Health Assessment – Area #6

- The **Area #6** results again scored **high** for the **aggregate stability** and **available water capacity** indicators. However, both the **surface hardness** and **subsurface hardness** indicators scored **low**. Compaction at these levels usually impacts several or all of the following biological indicators. **Area #6** is the largest in square footage of all the areas assessed.
- The biological indicators in this area assessment again present an interesting mixed bag of results. The percent of **organic matter** scores are **high.** However, the indicators for **active carbon** and **mineralizable N** scored **low** and **high** respectively. The heavy soil compaction present in this area is creating a growing anaerobic environment in the soil which in turn is impacting the microbial communities and the entire soil food web. Unless the compaction is addressed in some manner these conditions will continue to degrade and the health of the plant material at the site will start to decline. The **root health rating** also scored **medium** in the assessment giving further evidence that the soil food web in this area is in decline**.**
- The soil chemistry indicators in this area are exhibiting **low** scores for both **pH** and **Minor Elements** which appear to be the result of a combination of factors including the soil texture – sandy loam, nutrient leaching, and erosion due to sparse vegetation and topography.
- In addition, the loss of nutrient base cations such as Mg++ and Ca++ from the soil profile causes a drop in soil pH which acts as a gauge for the availability of the many minor or micro elements present in the soil.

Soil Health Assessment Summary:

The soil health assessment protocol overall illustrates the importance of understanding the integrated relationship of soil physics, soil biology, and soil chemistry. The data gleaned from the six soil health assessments provides important data for how the soil is currently functioning.

The major underlying constraint common to all areas at the Winthrop Square site is **soil compaction,** both at the **surface** and **subsurface** levels. As intimated above, problems with the physical components of the soil eventually begin to negatively impact both the biological and chemical components of the soil. The results of the assessments for the site show this correlation. Compacted soils limit water infiltration, create runoff and erosion, and contribute to an anaerobic condition in the soil. This leads to unfavorable growing conditions for plant material at the site and ultimately the decline of that plant material.

However, on a positive note, all the areas at the site scored high across the board for both **aggregate stability** and **available water capacity.** Good aggregates don't just happen. I believe there are several reasons for the high scores at the site for these indicators:

- The site has had little to no disturbance over the past several years in terms of building or construction operations. It is also my understanding that the site has not had any building on it since the founding of Boston.
- The overall site is protected by an outer iron fence in addition to the inner iron fence protecting the monument. This fencing limits vehicular traffic from randomly driving over the site and together with the paved walkways does somewhat guide pedestrian traffic as well.
- The site has been under some type of continuous vegetation in addition to a variety of assorted land husbandry techniques and operations over the years.
- The soil at Winthrop Square is also derived from its own parent material unlike most of Boston which consists of fill. I have found in my soil travels that this does make a difference. I have noticed similar conditions in other natural land forms around Boston (the Boston Common). Interestingly, the filled sites, like the Back Bay for instance, exhibit poor aggregate integrity and available water capacity.

Recommendations

Addressing the soil compaction issues at the site will help alleviate many of the issues evidenced by the soil biological indicators. The breakup of the surface and subsurface hardness will contribute to a beneficial aerobic soil environment and improve growing conditions at the site. Most of the organic matter content of the site is adequate, although additional compost should be added during remediation and as a top dress in annual maintenance operations to help improve and maintain the biological health of the soil.

Once the soil food web is fully functional and active again, the soil chemistry indicators should come back within acceptable parameters. I recommend that a long term fertility component be incorporated at the time of remediation in the form of mineral amendments, rock dusts, and powders, which will help to provide a continuing stream of nutrients over time and to help adjust and eventually stabilize the soil pH. Amending the sandy loam soil texture will help provide some measure of nutrient retention. For this purpose, I recommend the incorporation of bio-char. This material, much like clay, and to a degree, like organic matter, has superior electrostatic properties to help with nutrient retention. Bio-char has also exhibited good moisture retention properties which the site currently lacks.

Lastly, I strongly recommend incorporating a green manure or cover crop as part of the overall remediation scheme. Cover cropping is traditionally used in farming operations. However, the benefits as they pertain to soil health make them too valuable to ignore in this situation. A cocktail of cover crops used as an interim step following the breakup of the surface and subsurface hardness

helps to prevent wind/water erosion, provides necessary fresh organic residues to bolster the soil **active carbon,** and provides weed, and to a certain measure, disease suppression.

Remediation Plan for Winthrop Square

Soil Decompaction

I recommend a multi-tiered approach to address the soil compaction issues at the site. Due to the natural slope at the site, any remediation must be done in a manner that is careful not to destabilize the existing upper soil profile. Accordingly, I recommend that the project be done in phases. Areas #1, #2, #3 and #4 could all be done together as they do not impact the daily flow of foot traffic associated with the site. Areas #5 and #6 should be addressed individually as they are the two largest areas and appear to see the most foot traffic.

The compaction issues can be addressed using the following tools/techniques. All three strategies should be utilized due to the diverse nature of the site and to help minimize soil erosion during the remediation process.

- **Air Spading** uses a specialized tool and compressed air to dislodge, breakup, and aerate compacted soil. Soil amendments are then added and "stirred" into the existing soil using the air tool. This would be useful for tree root collar work and excising of girdling roots as well as help address the surface hardness around the flare of the trees.
- **Vertical Composting** techniques utilize either air tools or a mechanical soil auger to open up holes in the soil profile along a predetermined grid pattern in turf areas. Soil amendments are then added to these holes and graded over. The compaction layer is slowly broken up over time by the microbes as the holes begin to coalesce, reducing compaction and improving the overall soil health.
- **Radial Trenching**: Much like the root collar technique, this technique works on a radial pattern of trenches, radiating from the trunk of the tree, either dug by hand, by machine or through the use of air tools. Soil amendments are then added to help stimulate the fibrous roots of the tree.

I recommend a selection of both dry and liquid soil amendments in conjunction with the de-compaction work:

- **Compost** – a good compost blend is a must. It helps to not only add fresh organic matter to those areas where it is needed, but also serves as a carrier for the dry soil amendments to ease incorporation into the soil, particularly with the air tools.
    - The addition of mineral amendments on the order of rock phosphate, green sand, azomite (trace elements), and humic acid all help to supply a long term fertility component and also help to condition the soil.
- **Bio-char –** Given the sandy loam texture at the site, incorporating bio-char into the soil remediation program will increase fertility retention in the soil, improve microbial habitat, and provide long term moisture retention.
- **Cover crops** – a green manure mixture or 'cocktail' including buckwheat, oats, winter rye, and vetch will help provide initial cover once de-compaction operations have concluded. Some of the benefits of planting a cover crop include supplying organic matter, increasing active carbon, providing aggregate stability, increasing available water capacity, providing weed and disease suppression, and providing erosion control
- **Liquid amendments** – In order to help activate the soil microbes following de-compaction operations, I recommend adding a liquid microbial food with a mixture of fish hydrolysate, molasses, kelp, and humic acid to the entire site. In addition, in order to continually feed the soil food web populations, I recommend a seasonal (spring, summer and fall) application of the same liquid microbial food be incorporated into the annual maintenance program.

Maintenance Recommendations:

The soil remediation efforts detailed above will only last as long as the necessary annual cultural practices are, and continue to be, implemented. Since most of the surface area at the site is turf, I recommend that an annual maintenance program be implemented which includes:

- Top dressing of turf area with ¼" of compost.
- A spring application of a low analysis organic fertilizer.
- Limestone for pH adjustment per an annual soil testing.
- Late spring/early summer bio-stimulant application with fungal foods (humic acid, fish hydrolysate or kelp) for the benefit of the tree stand.
- Late summer/early fall core aeration followed by slice seeding.
- A fall application of a low analysis organic fertilizer.
- Mowing height should be held at 3.5-4" and always done with sharp blades.
- To the extent possible, keep pedestrian walking traffic on the walkways and off the turf and away from the root zones of the trees.

Lastly, I want to mention irrigation. I know there is no irrigation on the site, however, while addressing the compaction will allow for more frequent and deeper penetration of natural rainfall, the site does need some regular irrigation plan. I recommend utilizing moisture sensors to determine proper moisture depth and frequency. Supplemental watering will be a necessary cultural practice to maintain and ensure the continued soil health at the site.